MIRKIN, B.M.; MIFTAKHOV, M.N.

Genesis of floodplain soils and its relation with the successions of vegetation in the floodplain of the middle course of the Belaya River. Vest.LGU 18 no.3:74-81 '63. (MIRA 16:2)
(BELAYA VALLEY (BASHKIRIA)--PLANT SUCCESSION)
(BELAYA VALLEY (BASHKIRIA)--SOIL FORMATION)

MIRKIN, B.M.

Economic typology of natural forage lands in the floodplain of the Belaya River. Bot.zhur. 48 no.2:223-230 F '63. (MIRA 16:4)

1. Leningradskiy gosudarstvennyy universitet.
(Belay Valley (Bashkiria)—Pastures and meadows)

MIRKIN, B.M.

Steppe flora in the floodplain of the Belaya River. Bot. zhur. 48 no.7:1026-1030 Jl '63. (MIRA 16:9)

1. Leningradskiy gosudarstvennyy universitet.
(Belaya Valley(Bashkiria)—Steppe flora)

MacKil, B.M.; [illegible]

Geobotany at the second Interuniversity Conference "Contribution of Universities to Agriculture". Bot. zhur. 48 no.7: [illegible] Jl '63. (MIRA 16:9)

1. Leningradskiy gosudarstvennyy universitet.
(Phytogeography) Botany, Economic

MIRKIN, B.M.; SHVEDCHIKOV, G.V.

Formation of soils in the floodplain of the Belaya River. Vest. LGU 19 no.3:139-144 '64. (MIRA 17:3)

MIRKIN, B.M.; NAZIROVA, Z.M.; BATALOV, A.A.

Problems of botany at the Second Scientific Session of the Institutions of Higher Learning in the Volga Valley. Bot. zhur. 49 no.9:1381-1382 S '64. (MIRA 17:12)

1. Bashkirskiy gosudarstvennyy universitet, Ufa.

MIRKIN, B.M.

Ecological classification of the [illegible] vegetation. [illegible].
Bot. zhur. 50 no.3:[illegible]. Mr '65. (MIRA 18:6)

1. Bashkirskiy [illegible] universitet, Ufa.

MIRKIN, D.B., inzhener.

Treating freshly laid concrete with wet bitumen. Avt.dor. 18 no.8:6-7 D '55. (MLRA 9:5)
(Roads, Concrete)

MIRKINA, Kh.S.; MIRKIN, D.F.

Automatic mixer for blending lubricating grease samples before determination of penetrability. Proizv. smaz. mat. no.4:39-43 '57. (MIRA 11:9)

1.Rostovskiy neftemaslozavod (for Mirkina) 2.Sibirskiy avtodorozhnyy institut (for Mirkin).
(Lubrication and lubricants--Testing)

MIRKIN, D.F., inzhener.

Preventing settling cracks in cement concrete pavements. Avt. dor. 20 no.2:7-9 F '57. (MLRA 10:4)
(Pavements, Concrete)

MIRKIN, D.F., inzh.

Using liquid bitumens in curing concretes. Bet. i zhel.-bet. no.4:187-189 Ap '59. (MIRA 12:6)
(Bitumen) (Concrete--Curing)

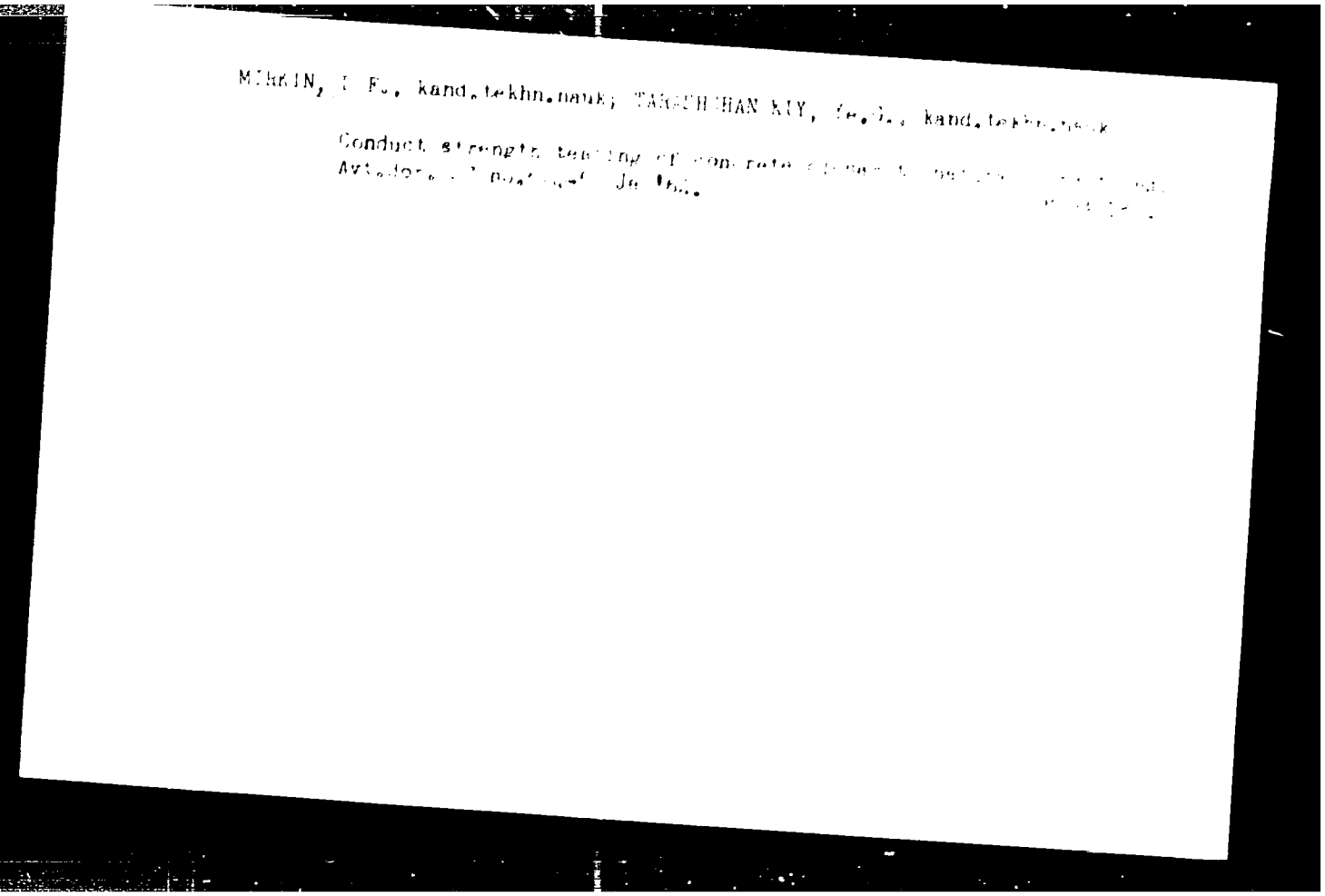
MIRKIN, D.F., inzh.

Thermal stresses in concrete pavements being cured under protective films. Avt.dor. 22 no.12:11-13 D '59.
(MIRA 13:4)
(Pavements, Concrete) (Concrete coating)

MIRKIN, D. F., CAND TECH SCI, "HARDENING OF CONCRETE UNDER PROTECTIVE COATINGS." OMSK, 1960. (MIN OF HIGHER AND SEC SPEC ED RSFSR, MOSCOW MOTOR HIGHWAYS INST). (KL, 3-61, 218).

MIRKIN, D.F.

Care of concrete pavements under changing temperatures near zero. Avt. dor. 24 no.8:8-10 Ag '61. (MIRA 14:9)
(Pavements, Concrete)



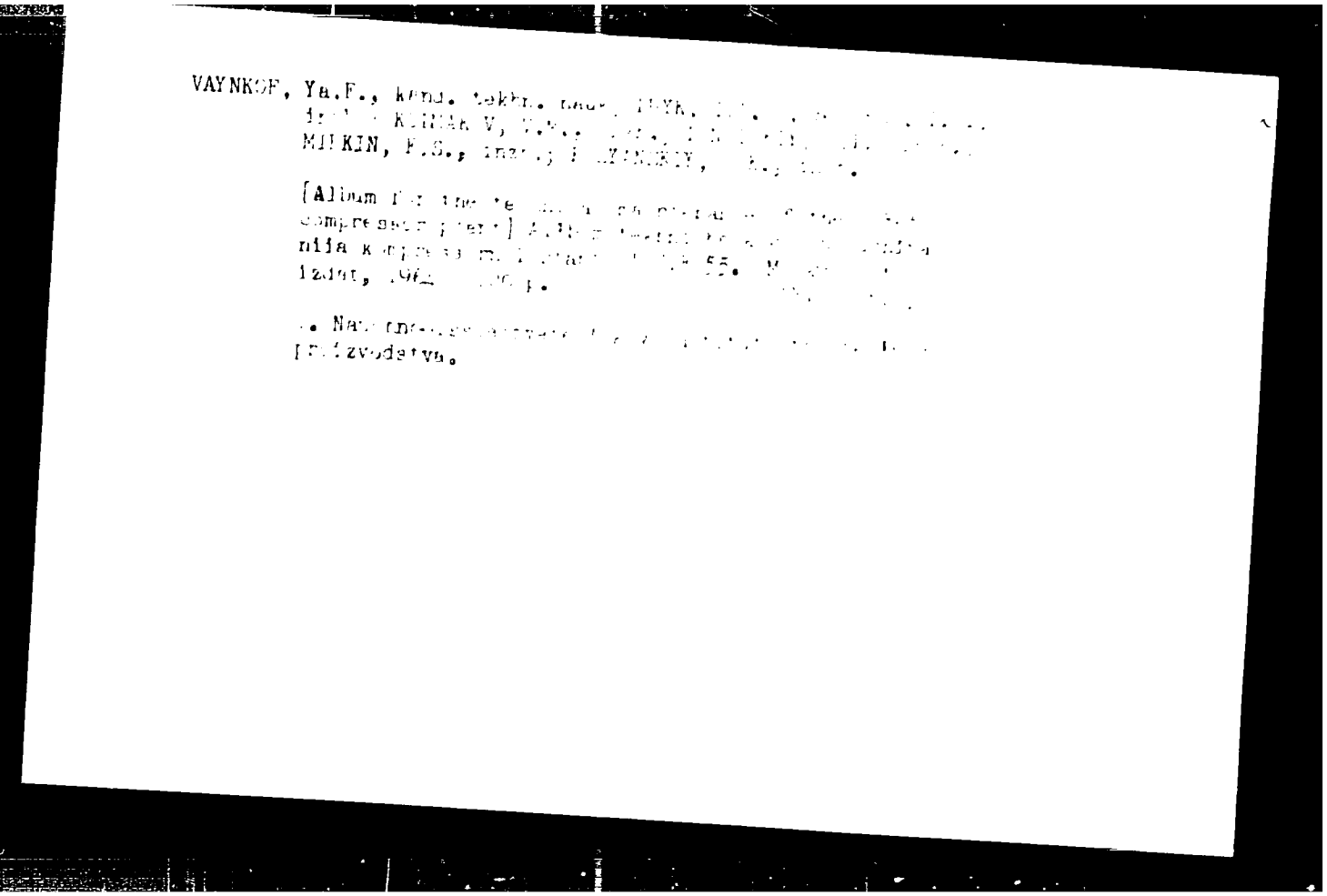
MIRKIN, I. F., kand. tekhn. nauk; TARCHIAN KIY, [illegible], kand. tekhn. nauk

Conduct strength testing of concrete [illegible]
Avtodor. i put'. stroi. Ja '61.

BOLIYEV, Ch.B., inzh.; KOLMAKOV, V.K., inzh.; LIBETSKIY, G.I., inzh.; LUYK, I.A., inzh.; MIRKIN, F.S., inzh.; POLYANSKIY, S.K., inzh.; YUDINA, L.A., red.

[Album for the maintenance of the E-501 excavator] Al'bom tekhnicheskogo obsluzhivaniia ekskavatora E-501. Moskva, Gosstroiizdat, 1963. 213 p. (MIRA 17:4)

1. Kiev. Nauchno-issledovatel'skiy institut organizatsii i mekhanizatsii stroitel'nogo proizvodstva.



VAYNKOF, Ya.F., kand. tekhn. nauk; [illegible]
[illegible]
MILKIN, F.S., inzh.; [illegible]

[Album [illegible]
compressor [text]] [illegible]
nija k[illegible]
izdat, [illegible]

[illegible]
[illegible]

VAYNKOF, Ya.F., kand. tekhn. nauk; LUYK, I.A.; SOLIYEV, I.P., inzh.; KOLMAKOV, V.M., inzh.; LINETSKIY, G.I., inzh.; MIRKIN, F.S., inzh.; POLYANSKIY, S.K., inzh.

[Album for the technical maintenance of the ZIF-55 compressor station] Al'bom tekhnicheskogo obsluzhivaniia kompressornoi stantsii ZIF-55. Moskva, Stroiizdat, 1964. 120 p. (MIRA 18:1)

1. Kiev. Nauchno-issledovatel'skiy institut stroitel'nogo proizvodstva.

VAYNKOF, Ya.F., kand. tekhn. nauk; LUYK, I.A., kand. tekhn. nauk; BOLIYEV, Ch.B., inzh.; ZHARDINOVSKIY, G.M., inzh.; KOLMAKOV, V.M., inzh.; LIBETSKIY, G.I., inzh.; MIAKIN, F.S., inzh.; POLYANSKIY, S.K., inzh.; RYSHKOVSKIY, V.N., inzh.

[Album on the maintenance of the 4043 and 4045 motor loaders] Al'bom tekhnicheskogo obsluzhivaniia avtopogruzchikov 4043 i 4045. Moskva, Stroiizdat, 1965. 78 p. (MIRA 18:4)

1. Nauchno-issledovatel'skiy institut stroitel'nogo proizvodstva.

VAYNKOF, Ya.F., kand. tekhn. nauk; LUYK, I.A.; BOLIYEV, Ch.B., inzh.; KOLMAKOV, V.M., inzh.; LINETSKIY, G.I., inzh.; MIRKIN, F.S., inzh.; POLYANSKIY, S.K., inzh.; RYSHKOVSKIY, V.N., inzh.

[Album for the technical maintenance of the K-124 truck crane] Al'bom tekhnicheskogo obsluzhivaniia pnevmokolesnogo krana K-124. Moskva, Stroiizdat, 1965. 126 p. (MIRA 18:4)

1. Nauchno-issledovatel'skiy institut stroitel'nogo proizvodstva.

LINETSKIY, G.I.; VAYNKOF, Ya.F., kand. tekhn. nauk; MIRKIN, F.S.; LUYK, I.A., kand. tekhn. nauk; BOLIYEV, Ch.B.; KOLMAKOV, V.M.; POLYANSKIY, S.K.; RYSHKOVSKIY, V.N.; RYAZANTSEVA, L.I., red.

[Album on the technical maintenance of the E-1252 excavator] Al'bom tekhnicheskogo obsluzhivaniia ekskavatora E-1252 Moskva, Stroiizdat, 1965. 112 p. (MIRA 18:8)

1. Kiev. Nauchno-issledovatel'skiy institut organizatsii i mekhanizatsii stroitel'nogo proizvodstva.

MIPKIN, G. A.

Steam Heating

Pneumatic test for central heating systems, Biul. stroi. tekh. 9, no. 11, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952, UNCLASSIFIED

GOBERMAN, M.D.; MIRKIN, G.A.; RUSAKOV, A.M.; YUSHKOV, V.A.; SEMIBRATOV, V.M., inzh., nauchnyy red.; MORSKOY, K.L., red.izd-va; MEDVEDEV, L.Ya., tekhn.red.

[Handbook for norm-setters in the construction industry] Spravochnik normirovshchika v stroitel'stve. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1959. 263 p. (MIRA 12:6)
(Construction industry)

MIRKIN, G. M.

Mirkin, G. M. "On the effect of the unequal mobility of constantly interbedded sands upon the yield of mesh filter water wells," Razvedka nedr, 1948, No. 6, p. 36-38

SO: U-3264, 10 April 1953, (Letopis 'Zhurnal 'nykh Statey, no. 3, 1949)

MIRKIN, G.M.

Experimental data on the use of gravel slotted liners.
Razved. i okh. nedr 25 no.12:42-45 D '59. (MIRA 13:6)

1. Gosudarstvennyy proyektnyy institut Vodokanalproyekt.
(Filters and filtration)

MIRKIN, G.M.

Terrain configuration and water-bearing capacity of limestones, marls, and chalk. Vod. i san. tekh. no.11:12-14 N '60.
(MIRA 13:11)

(Water, Underground) (Rocks, Carbonate)

MIRKIN, G.R.

Data on tectonic macrojoints of rocks in connection with structural analyses of local uplifts in the Tunguska syneclise. Trudy VNIGRI no.186:143-151 '61. (MIRA 15:3)
(Yenisey Valley--Joints (Geology))

GOL'BRAYKH, I.G.; ZABALUYEV, V.V.; MIRKIN, G.R.; SHAPOSHNIKOV, V.M.

Methods for studying the tectonics of closed areas. Geol.nefti i gaza 7 no.2:44-49 F '63. (MIRA 16:2)

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologorazvedochnyy institut i Stavropol'skiy filial Groznenskogo nauchno-issledovatel'skogo neftyanogo instituta.
(Geology, Structural)

GOL'DBERG, I.S.; MIRKIN, G.R.

History of the development of the structure of Turukhan District. Trudy VNIGRI no.220. Geol. sbor. no.8:166-184 '63. (MIRA 17:3)

GOL'BRAYKH, I.G.; ZABALUYEV, V.V.; MIRKIN, G.R.

Tectonic analyses of mega jointing as prospective methods for studying closed areas. Sov. geol. 8 no.4:63-73 Ap '65. (MIRA 18:7)

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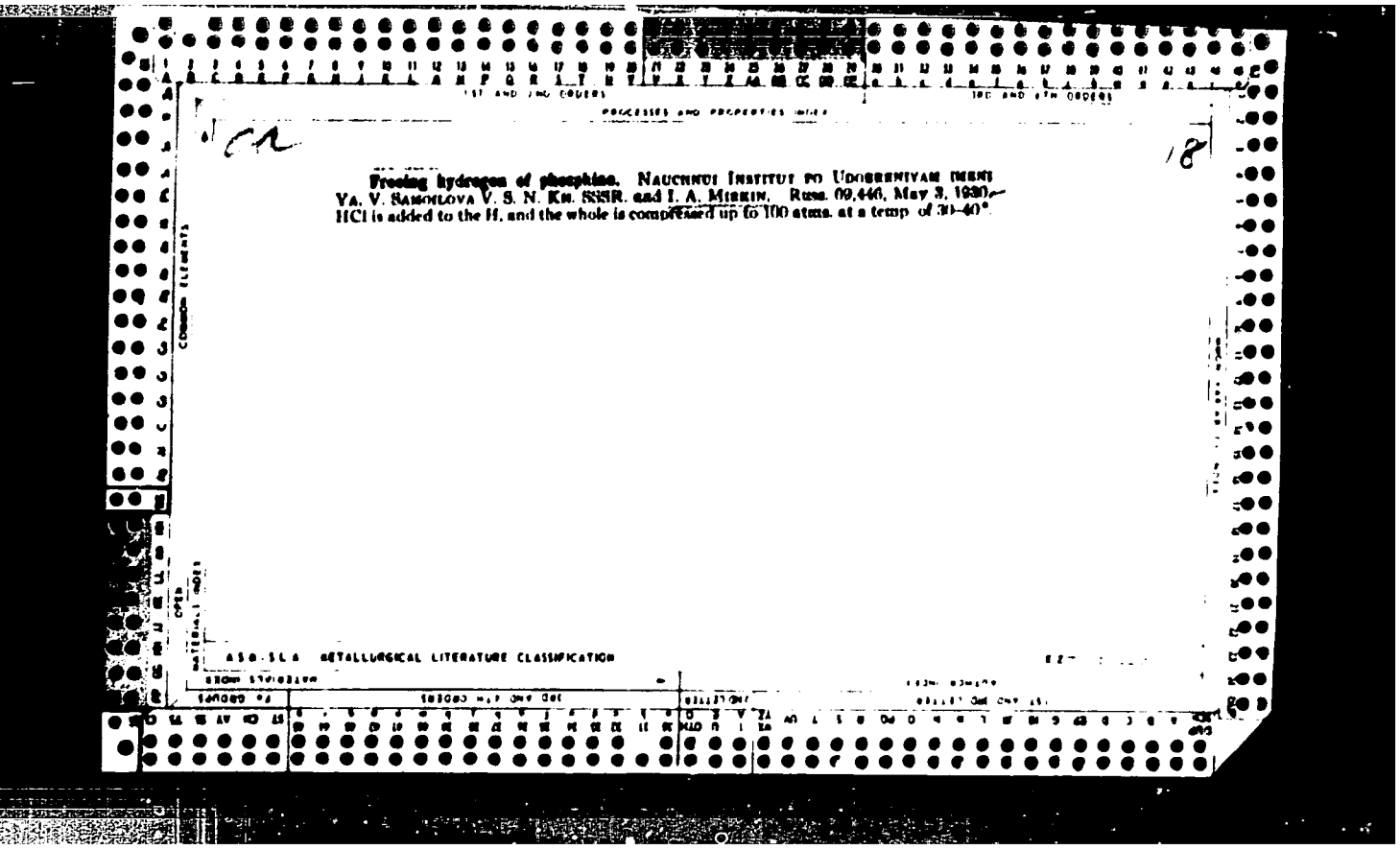
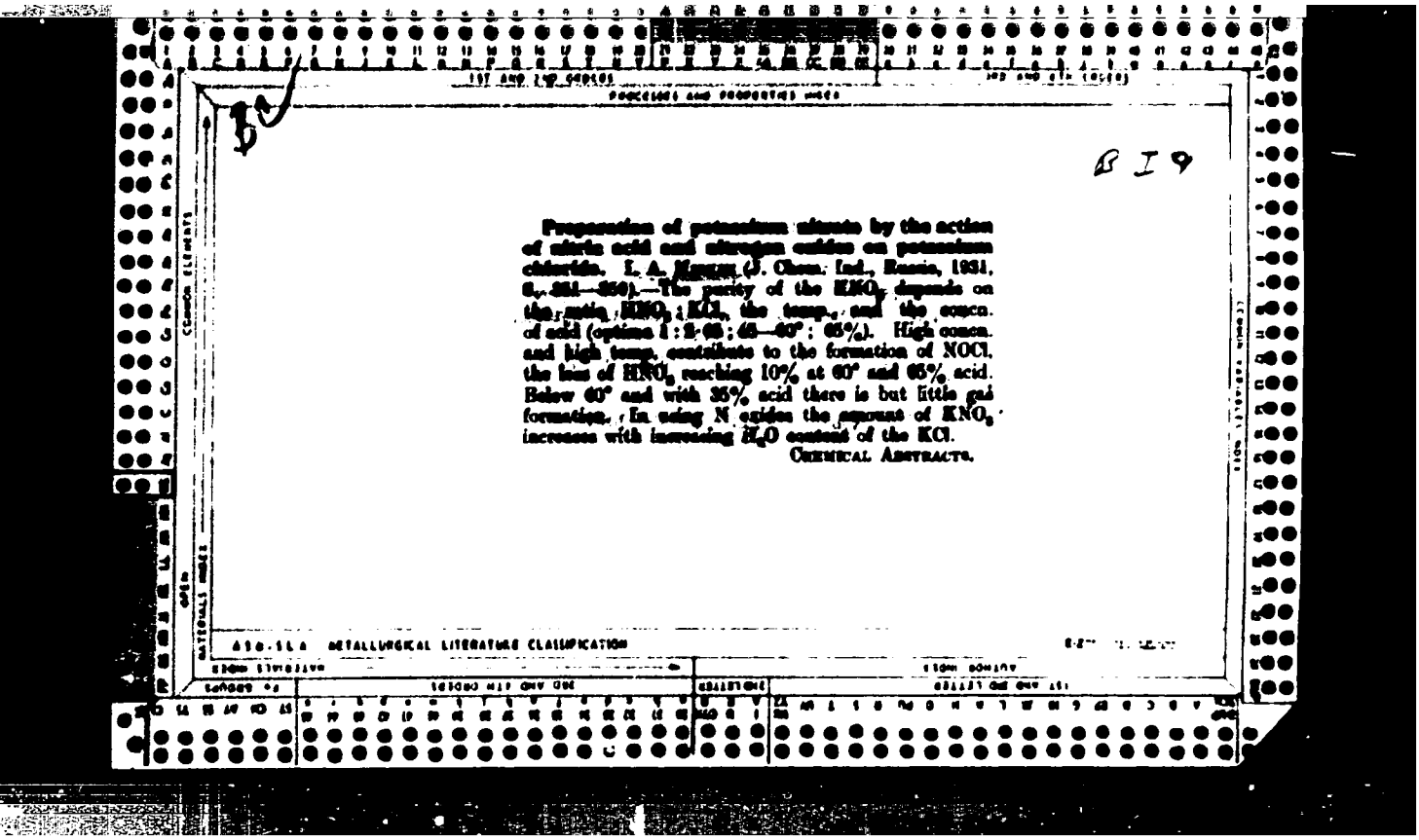


Freeing hydrogen of phosphine. NAUCHNOI INSTITUT PO UDOBRENIYAM INSHT
YA. V. SAMOILOVA V. S. N. KH. SSSR. and I. A. MISKIN. Russ. 09,446, May 3, 1930.
HCl is added to the H, and the whole is compressed up to 100 atms. at a temp of 30–40°.

A50-SLA METALLURGICAL LITERATURE CLASSIFICATION

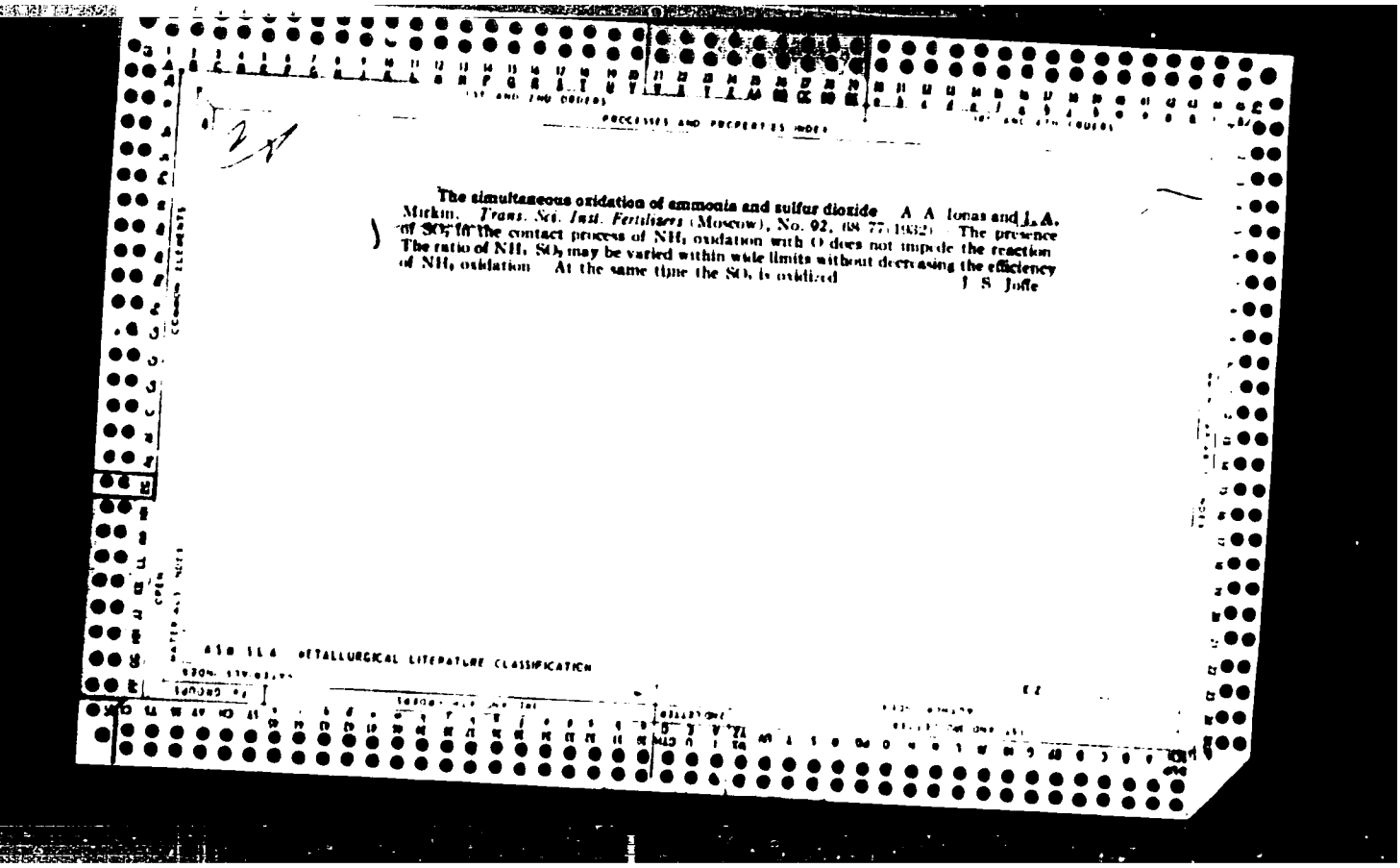


B I 9

Preparation of potassium nitrate by the action of nitric acid and nitrogen oxides on potassium chloride. I. A. Nagorny (J. Chem. Ind., Russia, 1931, 8, 881—890).—The purity of the KNO_3 depends on the ratio HNO_3 : KCl, the temp., and the concn. of acid (optima 1 : 1·05 ; 40—60° ; 65%). High concn. and high temp. contribute to the formation of NOCl, the loss of HNO_3 reaching 10% at 60° and 65% acid. Below 40° and with 35% acid there is but little gas formation. In using N oxides the amount of KNO_3 increases with increasing H_2O content of the KCl.

CHEMICAL ABSTRACTS.

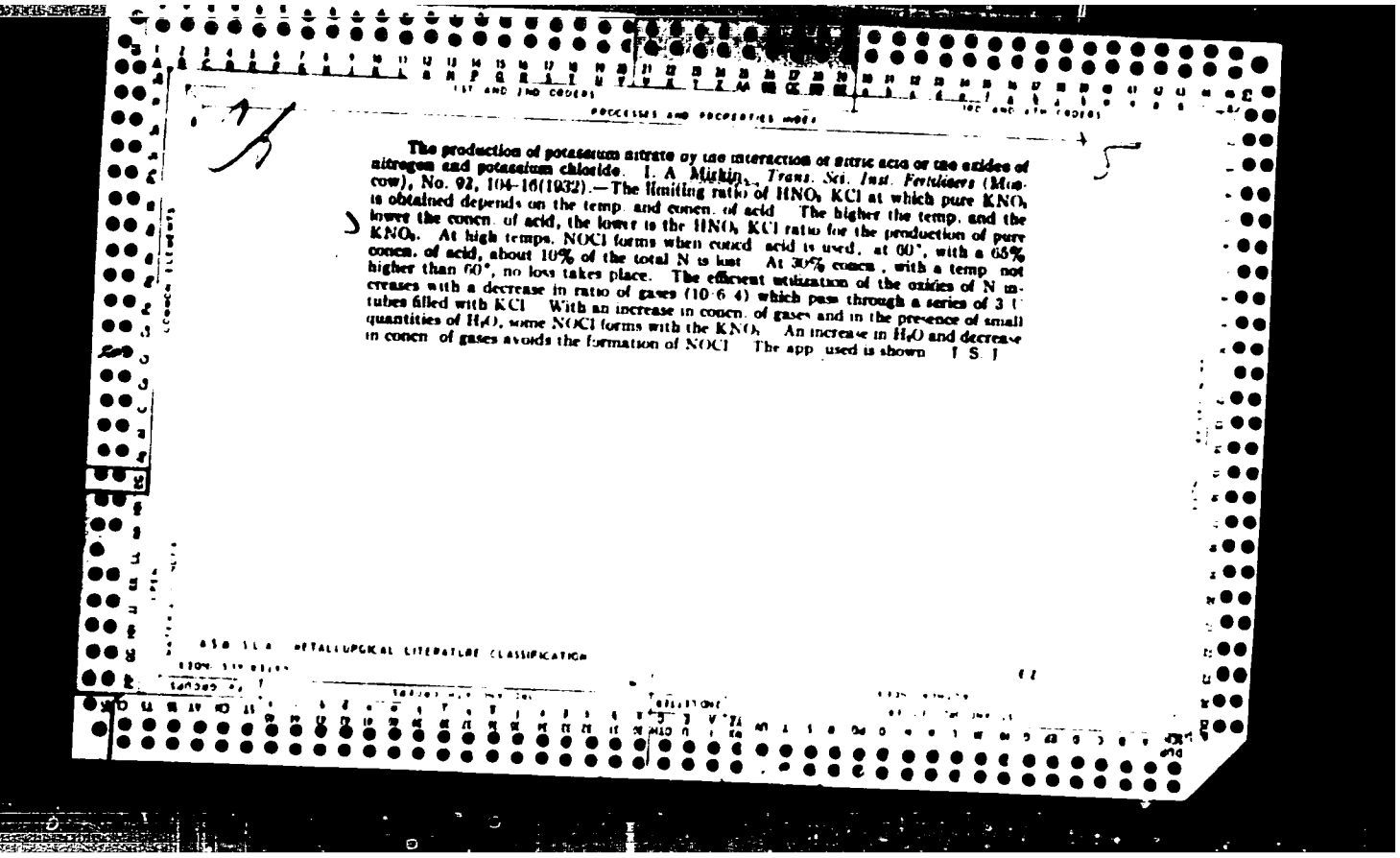
A10-11A METALLURGICAL LITERATURE CLASSIFICATION



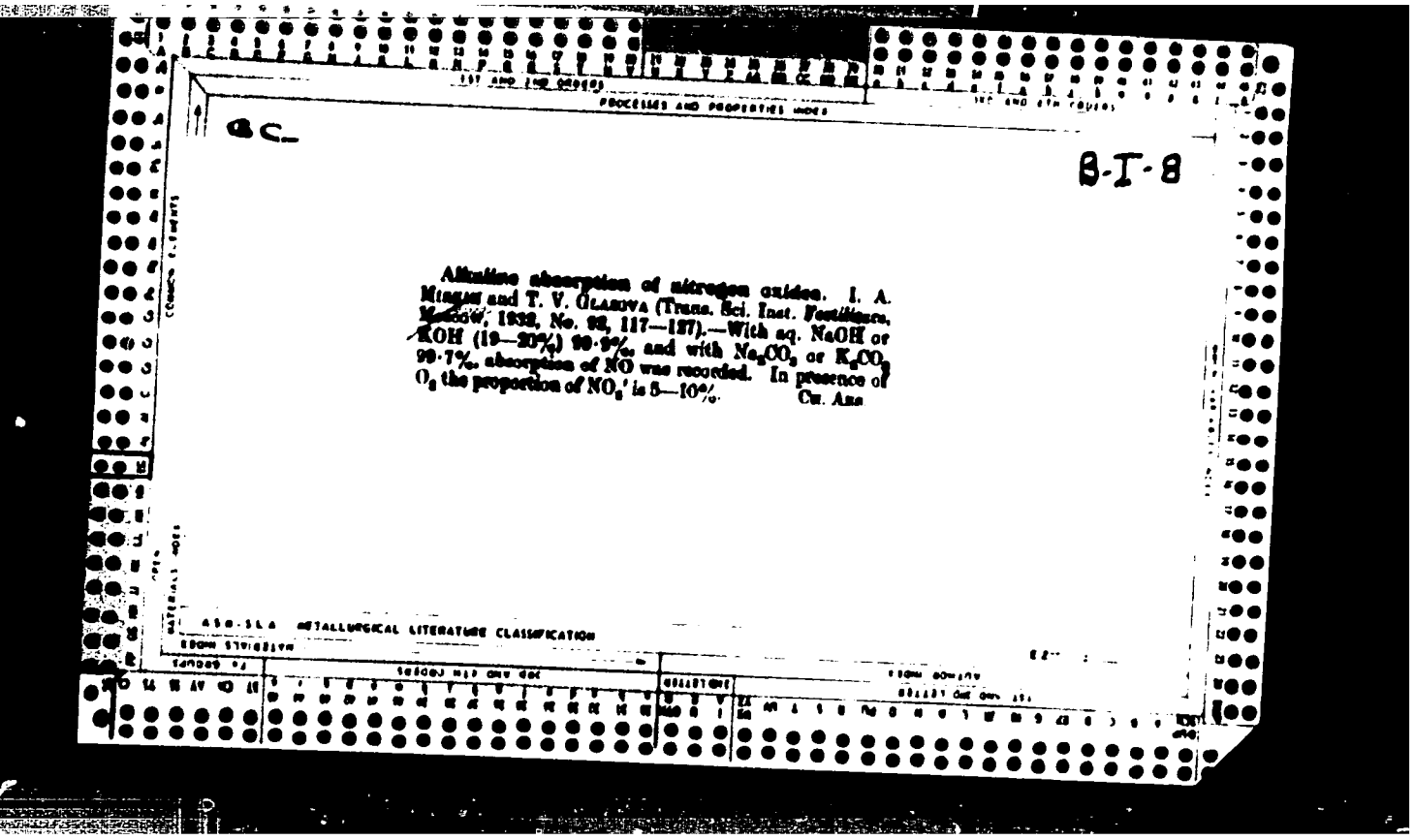
PROCESSES AND PROPERTIES INDEX

The simultaneous oxidation of ammonia and sulfur dioxide A A Ionas and I. A. Mirkin. *Trans. Sci. Inst. Fertilizers* (Moscow), No. 92, 68-77 (1932). The presence of SO_2 in the contact process of NH_3 oxidation with O does not impede the reaction. The ratio of NH_3: SO_2 may be varied within wide limits without decreasing the efficiency of NH_3 oxidation. At the same time the SO_2 is oxidized. J. S. Joffe

A58 V14 METALLURGICAL LITERATURE CLASSIFICATION



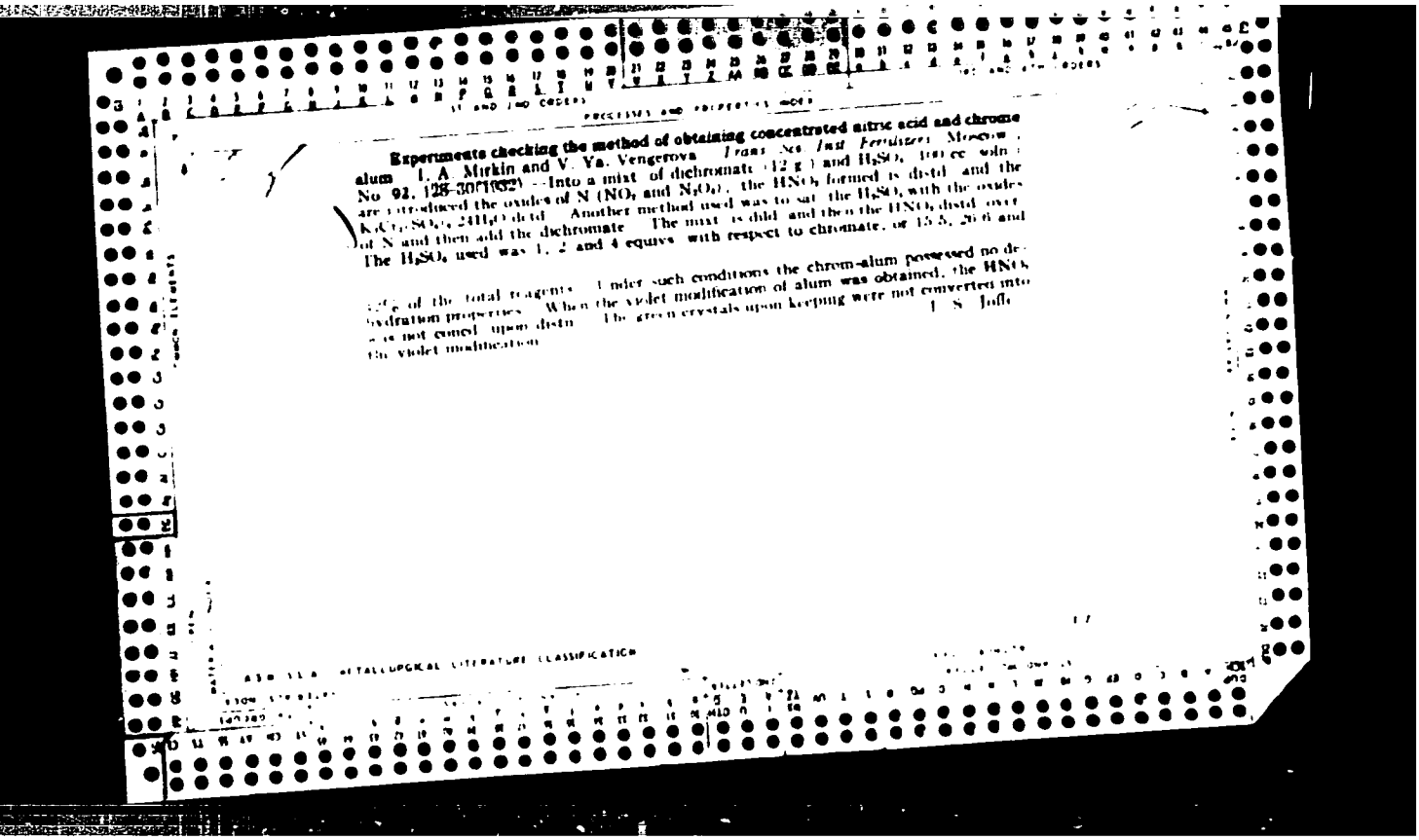
The production of potassium nitrate by the interaction of nitric acid or the oxides of nitrogen and potassium chloride. I. A. Mikin. *Trans. Sci. Inst. Fertilizers* (Moscow), No. 92, 104-16(1932).—The limiting ratio of HNO_3 KCl at which pure KNO_3 is obtained depends on the temp. and concn. of acid. The higher the temp. and the lower the concn. of acid, the lower is the HNO_3 KCl ratio for the production of pure KNO_3. At high temps. NOCl forms when concd. acid is used, at 60°, with a 65% concn. of acid, about 10% of the total N is lost. At 30% concn., with a temp. not higher than 60°, no loss takes place. The efficient utilization of the oxides of N increases with a decrease in ratio of gases (10:6.4) which pass through a series of 3 U tubes filled with KCl. With an increase in concn. of gases and in the presence of small quantities of H_2O, some NOCl forms with the KNO_3. An increase in H_2O and decrease in concn. of gases avoids the formation of NOCl. The app. used is shown. [S.]



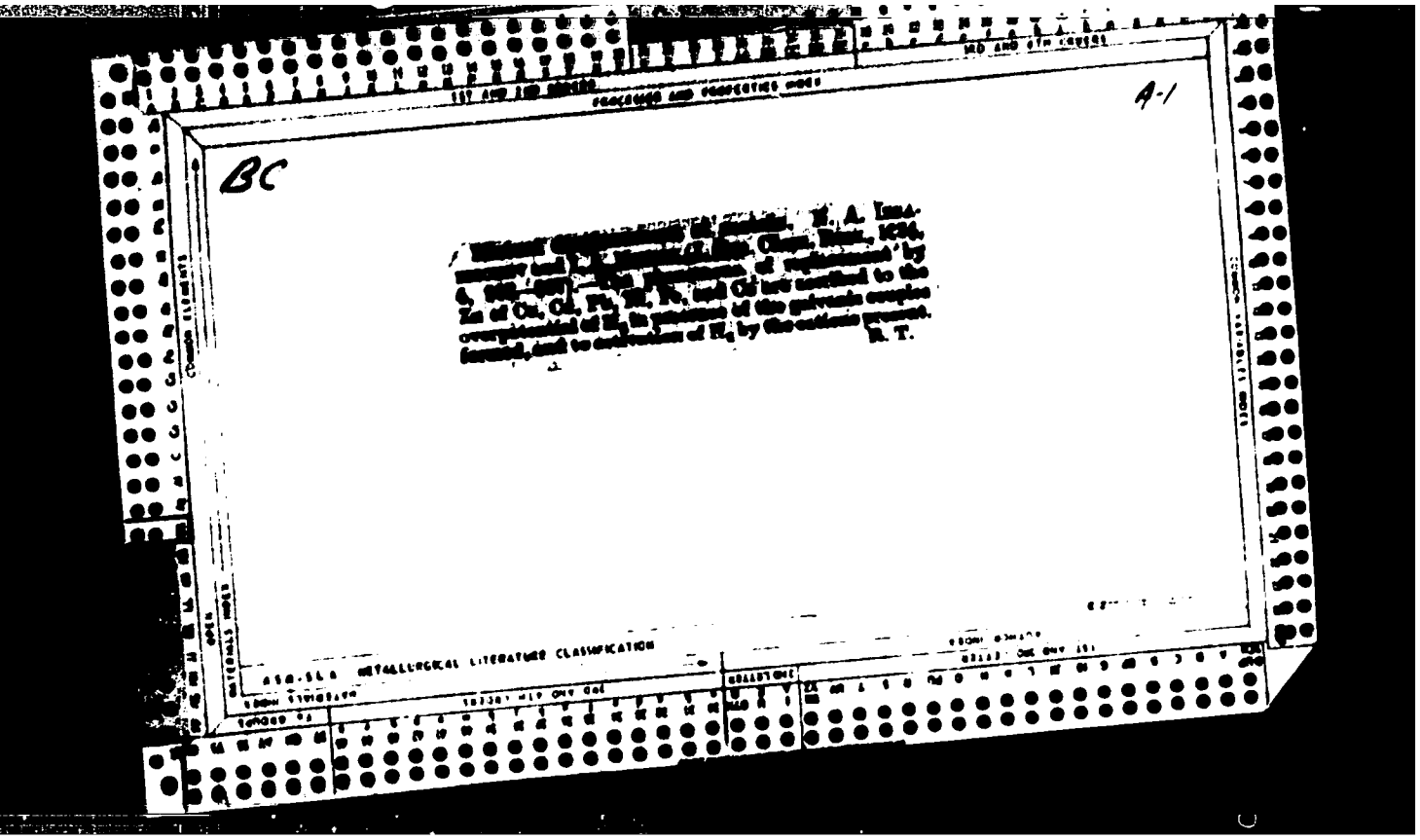
B-I-8

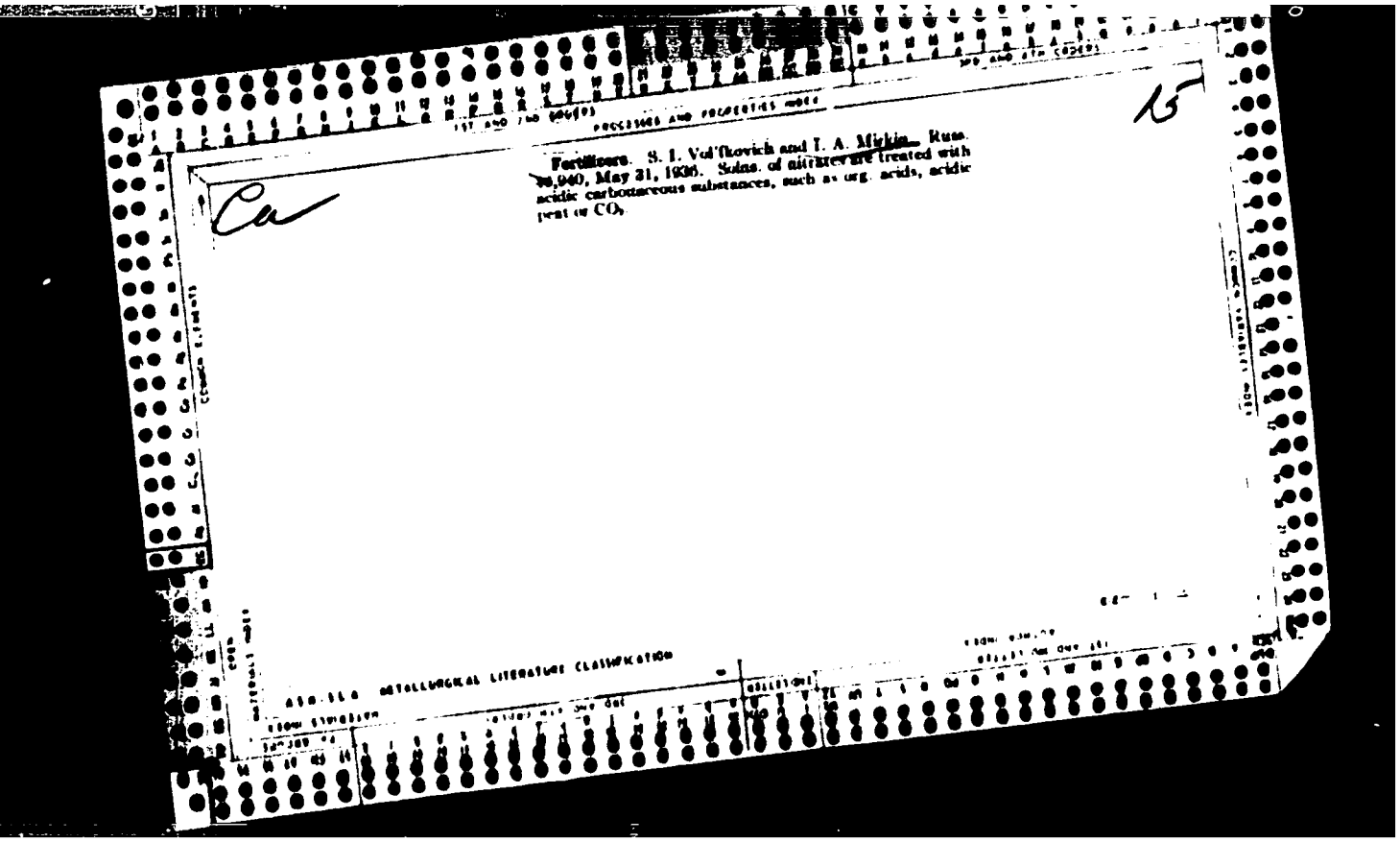
Alkaline absorption of nitrogen oxides. I. A. Mingaev and T. V. Glazova (Trans. Sci. Inst. Fertilizers, Moscow, 1932, No. 92, 117—127).—With aq. NaOH or KOH (19—20%) 99·9% and with Na_2CO_3 or K_2CO_3 99·7% absorption of NO was recorded. In presence of O_2 the proportion of NO_2' is 5—10%. Cu. Abs

METALLURGICAL LITERATURE CLASSIFICATION



Experiments checking the method of obtaining concentrated nitric acid and chrome alum I. A. Mirkin and V. Ya. Vengerova *Trans. Nov. Inst. Fertilizer, Moscow*, No. 92, 128-30(1932).—Into a mixt. of dichromate (12 g.) and H_2SO_4 (in ce. soln. are introduced the oxides of N (NO_2 and N_2O_4), the HNO_3 formed is distd. and the $K_2Cr_2(SO_4)_4 \cdot 24H_2O$ dried. Another method used was to sat. the H_2SO_4 with the oxides of N and then add the dichromate. The mixt. is chilled and then the HNO_3 distd. over. The H_2SO_4 used was 1, 2 and 4 equivs. with respect to chromate, or 15.5, 20.6 and [illegible] of the total reagents. Under such conditions the chrom-alum possessed no de- hydration properties. When the violet modification of alum was obtained, the HNO_3 is not esmol. upon distn. The green crystals upon keeping were not converted into the violet modification. I. S. Joffe





Fertilizers. S. I. Vol'fkovich and I. A. Mikhin. Russ. 39,040, May 31, 1936. Solns. of nitrates are treated with acidic carbonaceous substances, such as org. acids, acidic peat or CO_2.

MIRKIN, I.A.

Method for determining the composition of multicomponent ideal solutions in the process of their distillation and evaporation. Zhur.fiz.khim. 27 no.7: 941-949 Jl '53. (MLRA 6:9)
(Solutions (Chemistry)) (Distillation) (Evaporation)

USSR/Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry. Catalysis, B-9

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 403

Author: Mirkin, I. A., and Koltunov, V. S.

Institution: None

Title: Kinetics of the Oxidation of Oxalic Acid and of Oxalates by Nitric Acid in Aqueous Solution

Original Periodical: Zh. fiz. khimii, 1955, Vol 29, No 12, 2163-2172

Abstract: The kinetics of the oxidation of $(COOH)_2$ (0.2-1 M) by nitric acid (0.1-12.7 M) in aqueous solutions at 97° proceed autocatalytically. The induction period due to the accumulation of HNO_2 depends on the HNO_3 concentration. The rate after the end of the induction period is governed by the equation $d[H_2C_2O_4]/dt = 0.0029[H_2C_2O_4] \times [HNO_3]/(0.7 + [H]^2)$. The end products of the oxidation are CO_2 and NO (stoichiometric equation: $2HNO_3 + 3H_2C_2O_4 \rightarrow 6CO_2 + 2NO + 4H_2O$). The presence of NO_2, the concentration of which increases with increasing

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USSR/Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry. Catalysis, B-9

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 403

Abstract: HNO_3 concentration, can be explained by the secondary oxidation of NO by the nitric acid. The inhibiting effect of the H^+-ions is observed even in the presence of $Mn(NO_3)_2$ (catalyst).

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MIRKIN, I.A. (Moskva)

"Phase cotransitions." Zhur. fiz. khim. 36 no.1:176-180 Ja '62. (MIRA 16:8)

(Phase rule and equilibrium)

18 8200
24 4200

28882
S/590/61/101/000/001/015
D217/D304

AUTHORS: Mirkin, I.I., Doctor of Technical Sciences, Professor
Tseytlin, V.Z., Candidate of Technical Sciences, and
Morozova, G.G., Engineer

TITLE: Internal friction and modulus of slip of some pure metals used as constituents of refractory alloys

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya. [Trudy] v. 101, 1961. Issledovaniye novykh zharoprochnykh splavov dlya energetiki, 34 - 48

TEXT: A study of the temperature dependence of internal friction and modulus of slip for pure Ni, Al and Mo by means of low frequency torsional oscillations was carried out, using a modified Ke apparatus known as РКФ -2 (RKF-2). The modification was carried out by the Kafedra fiziki Instituta stali (Physics Department of the Steel Institute). By means of this instrument, the temperature dependence of internal friction and the modulus of slip of the ma-

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me specimen can be measured under vacuum. A vacuum of 1.10^{-3} to 10^{-4} mm Hg was maintained for the tests. The logarithmic decrement was taken as a measure of internal friction. The modulus of slip was proportional to the square of the frequency of free torsional oscillations of the specimen; the coefficient of proportionality depended only on the geometry and distribution of the masses in the system participating in the torsional oscillations. The specimens were wires, 500 mm long and having a diameter of 0.8 mm. The natural frequency of torsional oscillations of the specimen in all measurements was between 0.4 and 2 cycles/sec. The logarithmic decrement was determined by observing consecutive amplitudes of oscillation within a definite period of time. In all measurements and at all temperatures, the maximum amplitude of oscillation was less than 6 cm. For the wire specimens investigated, this amplitude corresponded to the maximum deformation by slip on the wire surface. An analysis of the results has led to the following conclusions: 1) The curve for the temperature dependence of internal friction of nickel exhibits three peaks: a) a low-temperature peak

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Internal friction and ...

at between 100 and 200°, due to the ferromagnetic striction phenomenon, b) a medium temperature peak between 500 and 600° or 400-900° under different conditions of annealing), due to stress relaxation along the grain boundaries during viscous slip of the grains c) a high-temperature peak between 700 and 800°, when measuring internal friction whilst annealing heavily deformed nickel; the nature of this peak is not yet fully understood. 2) Annealing heavily deformed nickel decreases internal friction. Increasing the annealing temperature from 500-950° results in an increase of the temperature of the medium-temperature peak, and only a further increase in annealing temperature to 1200° brings about a decrease in peak temperature 3) The temperature dependence of the modulus of slip at room temperature is similar to that of the Curie point; this is due to the ferromagnetic striction. 4) Only one peak is observed on the temperature dependence of internal friction curve for Al at between 100 and 200°; this is caused by relaxation of stresses along the grain boundaries 5) An increase in grain size with rise in annealing temperature lowers the height of the peak, since a decrease in the total length of boundaries decreases the

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Internal friction and ...

intensity of processes occurring along the grain boundaries. b) No peaks are observed on the temperature dependence curve for Mo on heating to 900°. c) The temperature range in which the internal friction curve begins to rise is greatest for Mo and lowest for Al. However, at comparable temperatures (T/T_{MP}), this range can be considered approximately constant for all three metals (T/T_{MP} = 0.35-0.40). There are 11 figures, 1 table, and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: S. Siegel and S. Onimby, Dependence of Young's modulus for nickel upon temperature and magnetization, "Physical Review", 49, 663, 1936.

Card 4/4

L 31037-66 EWT(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) MJW/JD

ACC NR: AP5027701 SOURCE CODE: UR/0129/65/000/011/0004/0009

AUTHOR: Mirkin, I. L.; Trusov, L. P.; Petropavlovskaya, Z. N.

ORG: TsNIITMASh

TITLE: Low-alloy heat-resistant steels for power generating machinery

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1965, 4-9

TOPIC TAGS: power plant component, low alloy steel, heat resistant steel, pearlitic steel

ABSTRACT: Considering the exceptionally long service life of power generating equipment (at least 10-15 years), its high operating parameters (as much as 580°C and 255 atm) and the trend toward building increasingly larger boiler-turbine units, the problem of improving the quality and durability of the components and elements of this equipment is of special importance. Currently the weight of individually cast turbine elements reaches 22-25 tons, and the wall thickness of steam lines reaches as much as 65-72 mm while their diameter may even exceed 400 mm. Under these conditions the assurance of uniform structure and properties is a particularly difficult task during various operations involved in the hot and cold working of power-machinery elements: tube bending, welding, welding-up of casting defects, and subsequent heat treatment. Proper batching of the melt is also essential, since even minor deviations

UDC: 669.14.018

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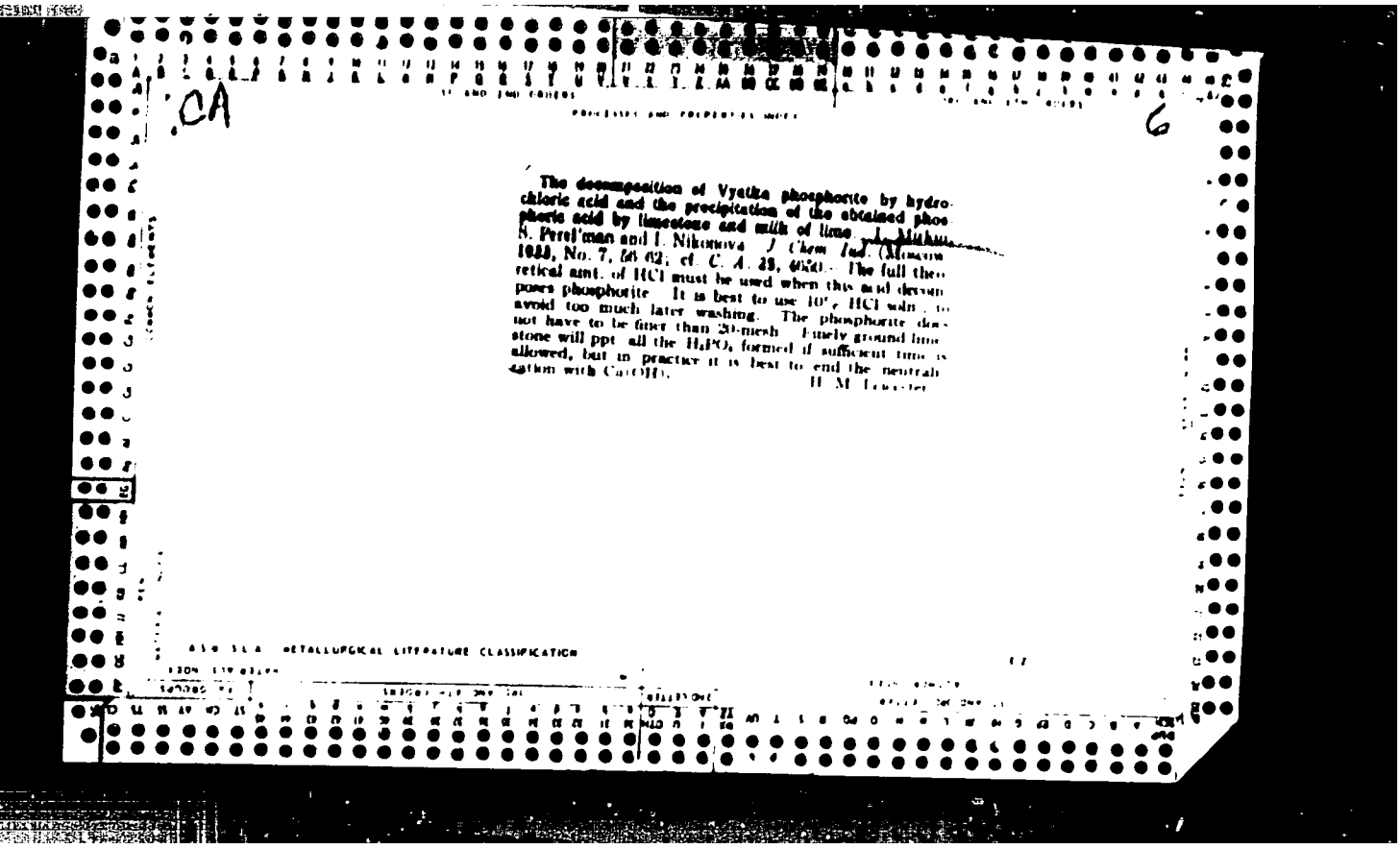
L 31037-66

ACC NR: AP5027701

may vitiate its structure and properties. Thus, e.g. reducing the Mn content of 15Kh1M1F steel (0.14-0.20% C, 1.2-1.7% Cr, 0.9-1.2% Mo and 0.25-0.40% V) to 0.4-0.7% from 0.9-1.1% leads to a shorter incubation period of austenite transformation and, as a result, sharply increases the critical cooling rate during air quenching and causes a marked nonuniformity of structure and properties at different cross sections of large-sized castings and thick-walled tubes. Further, the equipment used for heat and power generation operates in the regime of gradually increasing deformation and progressive stressing. Hence, the principal objective should be to maximally retard these processes. For operation at 500-600°C use is made of low-alloy heat resistant pearlitic steels and moreover martensite-ferrite steels containing 10-13% Cr are being developed for this purpose. Even more rigorous requirements apply to the heat-resistant materials used for the fastening fixtures of power machinery. The permissible plastic deformation of bolts and pins is at most 0.2% over a 1.5-2 year period. Orig. art. has: 6 figures.

SUB CODE: 10, 11, 13/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000

Card 2/2

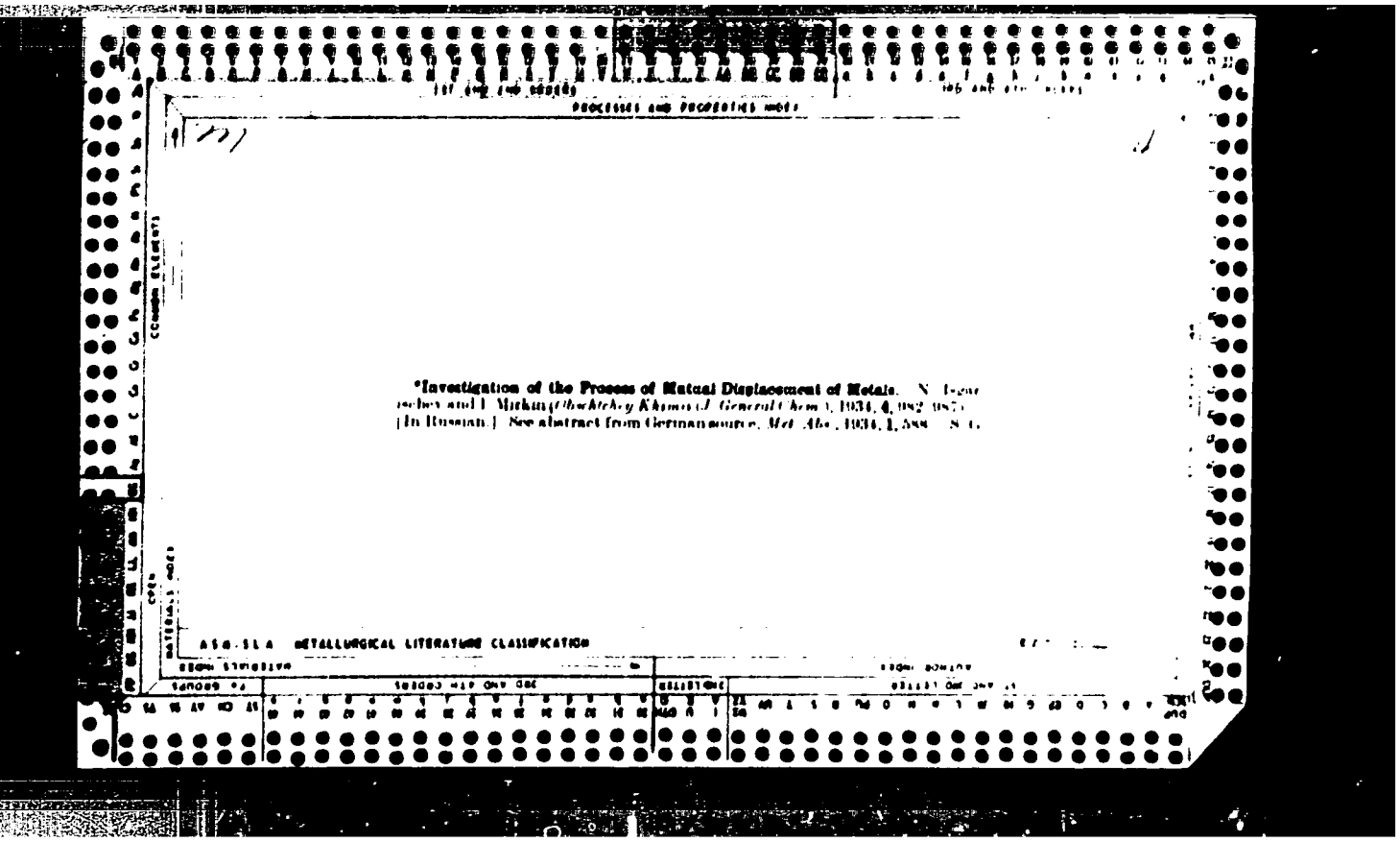


CA

6

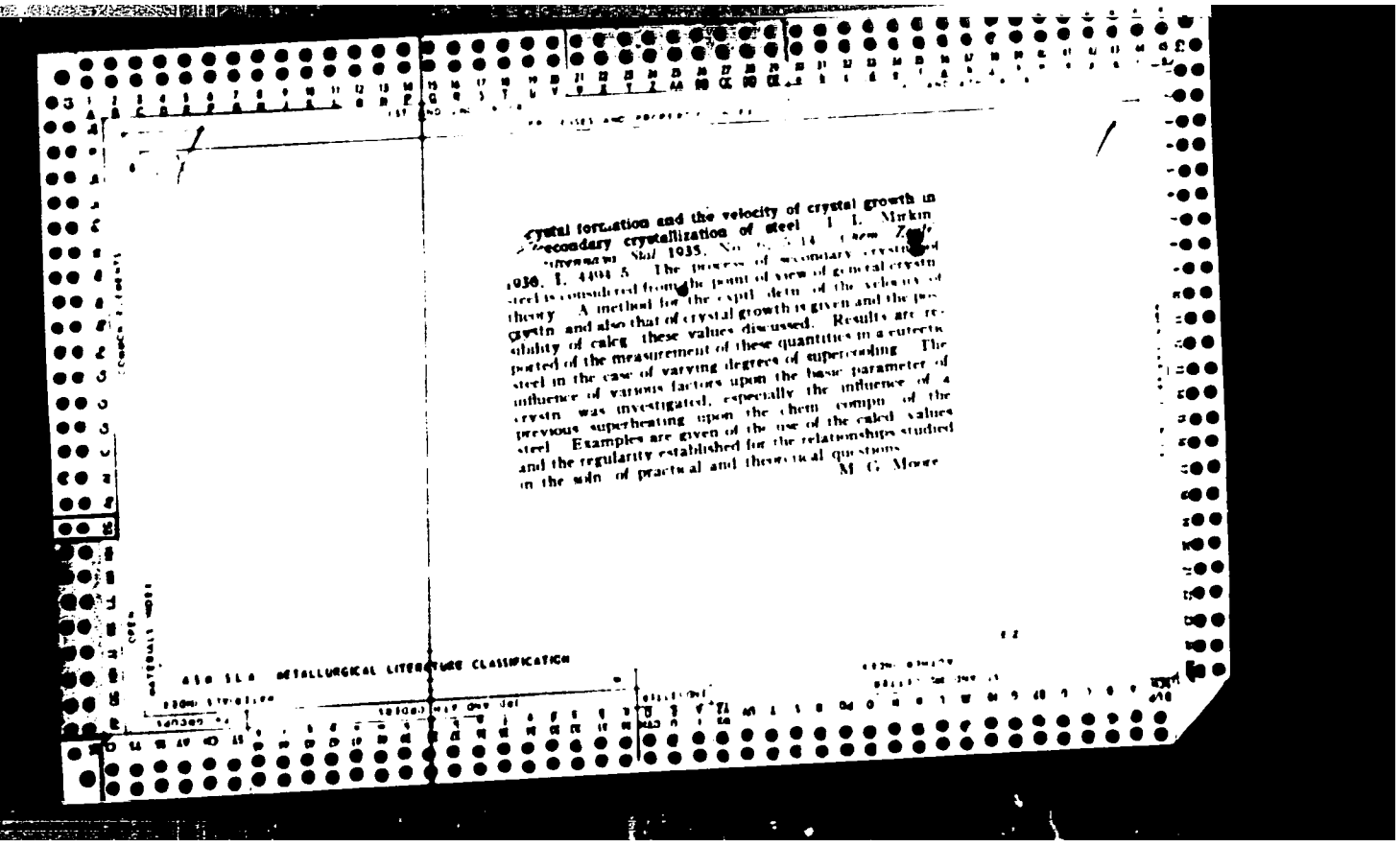
The decomposition of Vyatka phosphorite by hydrochloric acid and the precipitation of the obtained phosphoric acid by limestone and milk of lime. I. Mikhai... S. Perel'man and I. Nikonova. *J. Chem. Ind.* (Moscow) 1933, No. 7, 56-62; cf. *C. A.* 28, 4020. The full theoretical amt. of HCl must be used when this acid decomposes phosphorite. It is best to use 10% HCl soln., to avoid too much later washing. The phosphorite does not have to be finer than 50-mesh. Finely ground limestone will ppt. all the H_3PO_4 formed if sufficient time is allowed, but in practice it is best to end the neutralization with $Ca(OH)_2$.

H. M. Leicester



"Investigation of the Process of Mutual Displacement of Metals. N. [illegible] ... and I. Mirkin (Zhurnal Khimicheskoy Promyshlennosti [Journal of Chemical Industry], 1934, 4, 982-987) [In Russian.] See abstract from German source, Met. Abs., 1936, 3, 588. N. L.

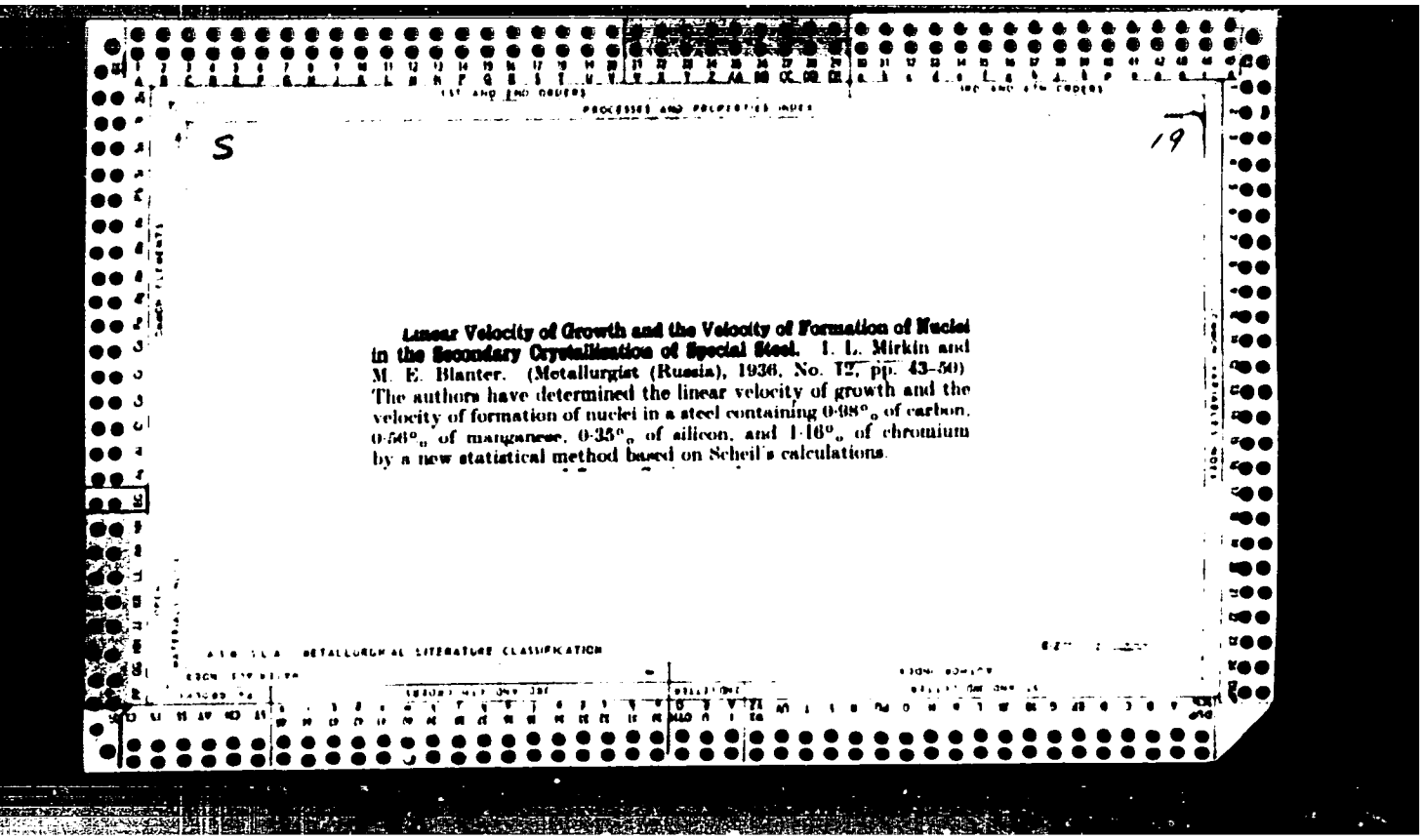
A50-51A METALLURGICAL LITERATURE CLASSIFICATION



Crystal formation and the velocity of crystal growth in secondary crystallization of steel I. L. Mirkin Zavod. Laboratoriya, Vol. 1035, No. [illegible] 1936. I. 4404 5. The process of secondary crystallization of steel is considered from the point of view of general crystallization theory. A method for the experimental determination of the velocity of crystn and also that of crystal growth is given and the possibility of calcg these values discussed. Results are reported of the measurement of these quantities in a eutectoid steel in the case of varying degrees of supercooling. The influence of various factors upon the basic parameter of crystn was investigated, especially the influence of a previous superheating upon the chem. compn. of the steel. Examples are given of the use of the calcd values and the regularity established for the relationships studied in the solu. of practical and theoretical questions.

M. G. Mower

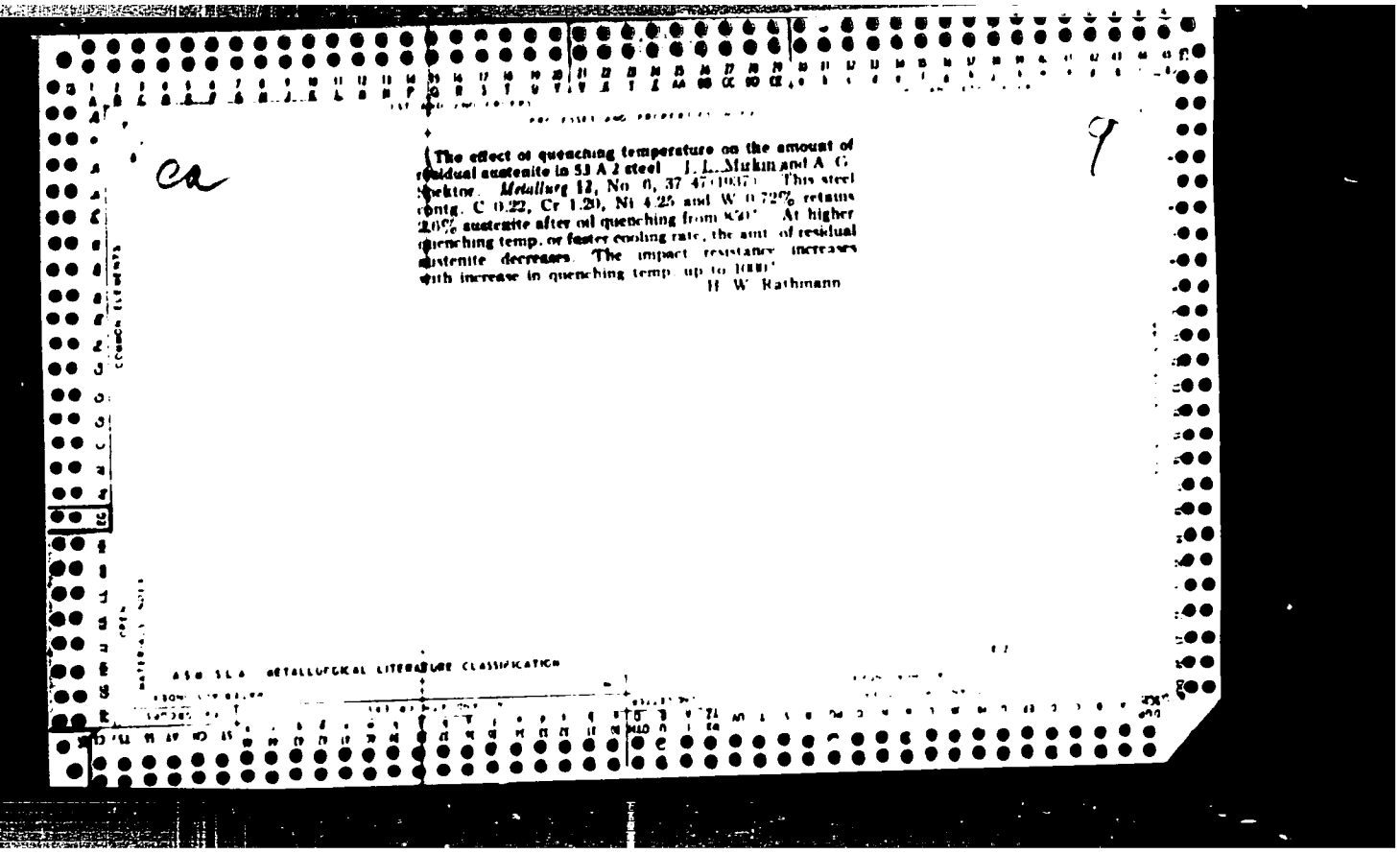
A10 SL8 METALLURGICAL LITERATURE CLASSIFICATION



S

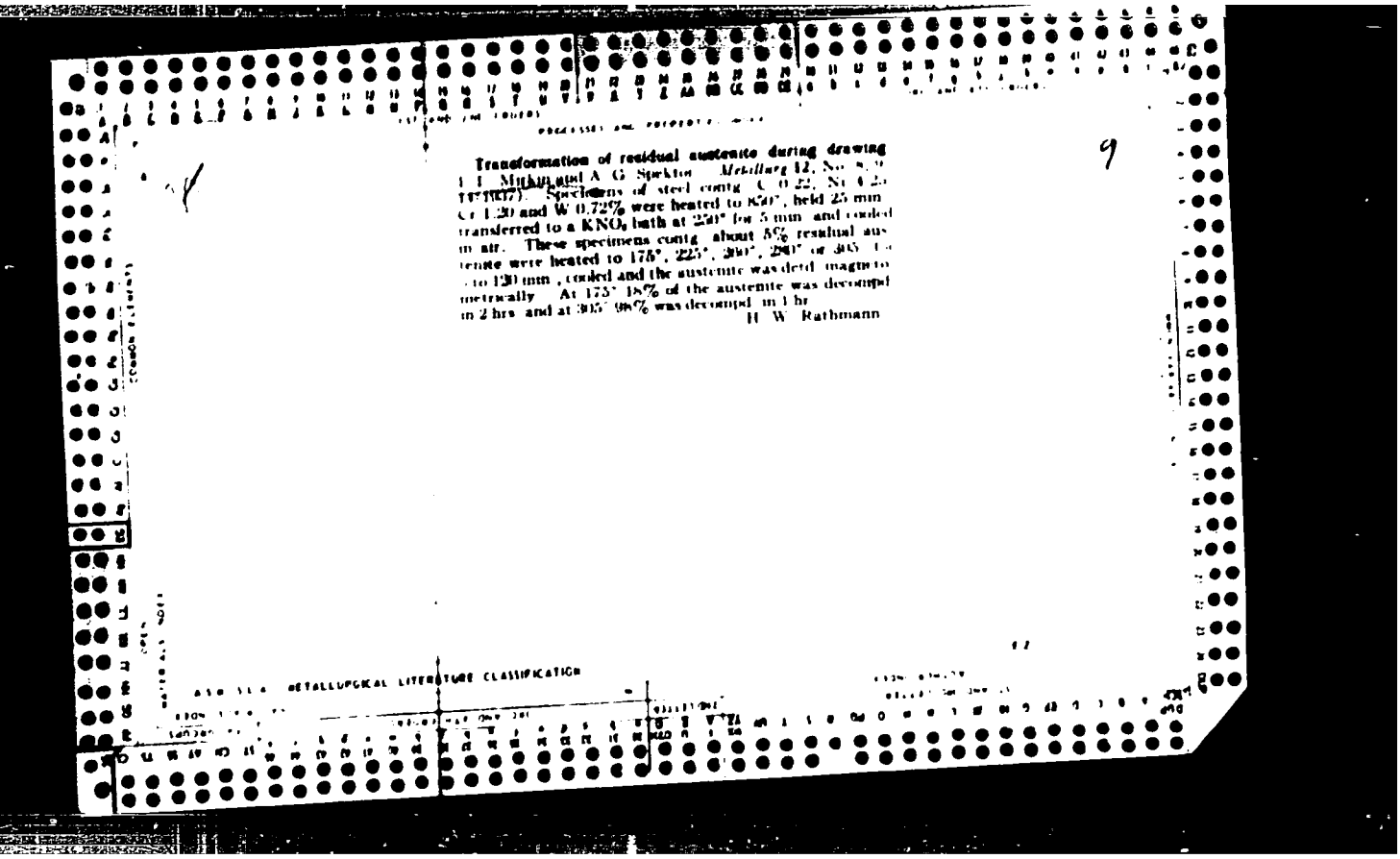
19

Linear Velocity of Growth and the Velocity of Formation of Nuclei in the Secondary Crystallisation of Special Steel. I. L. Mirkin and M. E. Blanter. (Metallurgist (Russia), 1936, No. 12, pp. 43–50) The authors have determined the linear velocity of growth and the velocity of formation of nuclei in a steel containing 0·98% of carbon, 0·56% of manganese, 0·35% of silicon, and 1·16% of chromium by a new statistical method based on Scheil's calculations.

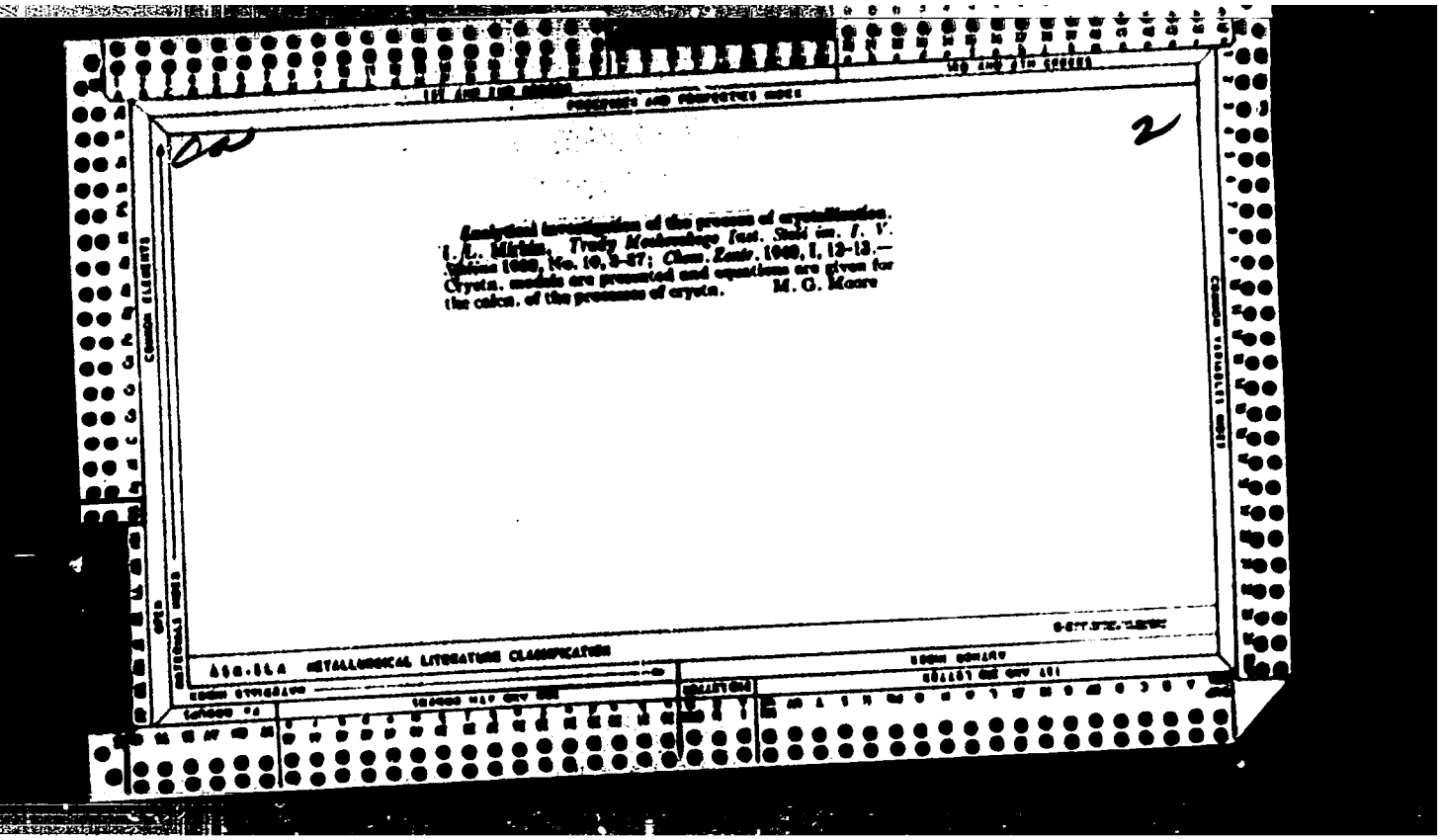


The effect of quenching temperature on the amount of residual austenite in 53 A 2 steel. I. L. Mirkin and A. G. Spektor. *Metallurg* 12, No. 6, 37-47 (1937). This steel contg. C 0.22, Cr 1.20, Ni 4.25 and W 0.72% retains 2.0% austenite after oil quenching from 850°. At higher quenching temp. or faster cooling rate, the amt. of residual austenite decreases. The impact resistance increases with increase in quenching temp. up to 1000°.
H. W. Rathmann

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION



Transformation of residual austenite during drawing I. I. Mikhan and A. G. Spektor. *Metallurg* 12, No. [illegible] (1957). Specimens of steel contg C 0.22, Si 0.2[illegible], Cr 1.20 and W 0.72% were heated to 850°, held 25 min transferred to a KNO_3 bath at 250° for 5 min and cooled in air. These specimens contg about 8% residual austenite were heated to 175°, 225°, 300°, 280° or 305° [illegible] to 120 mm., cooled and the austenite was detd magnetometrically. At 175° 18% of the austenite was decompd in 2 hrs and at 305° 98% was decompd in 1 hr. H. W. Rathmann

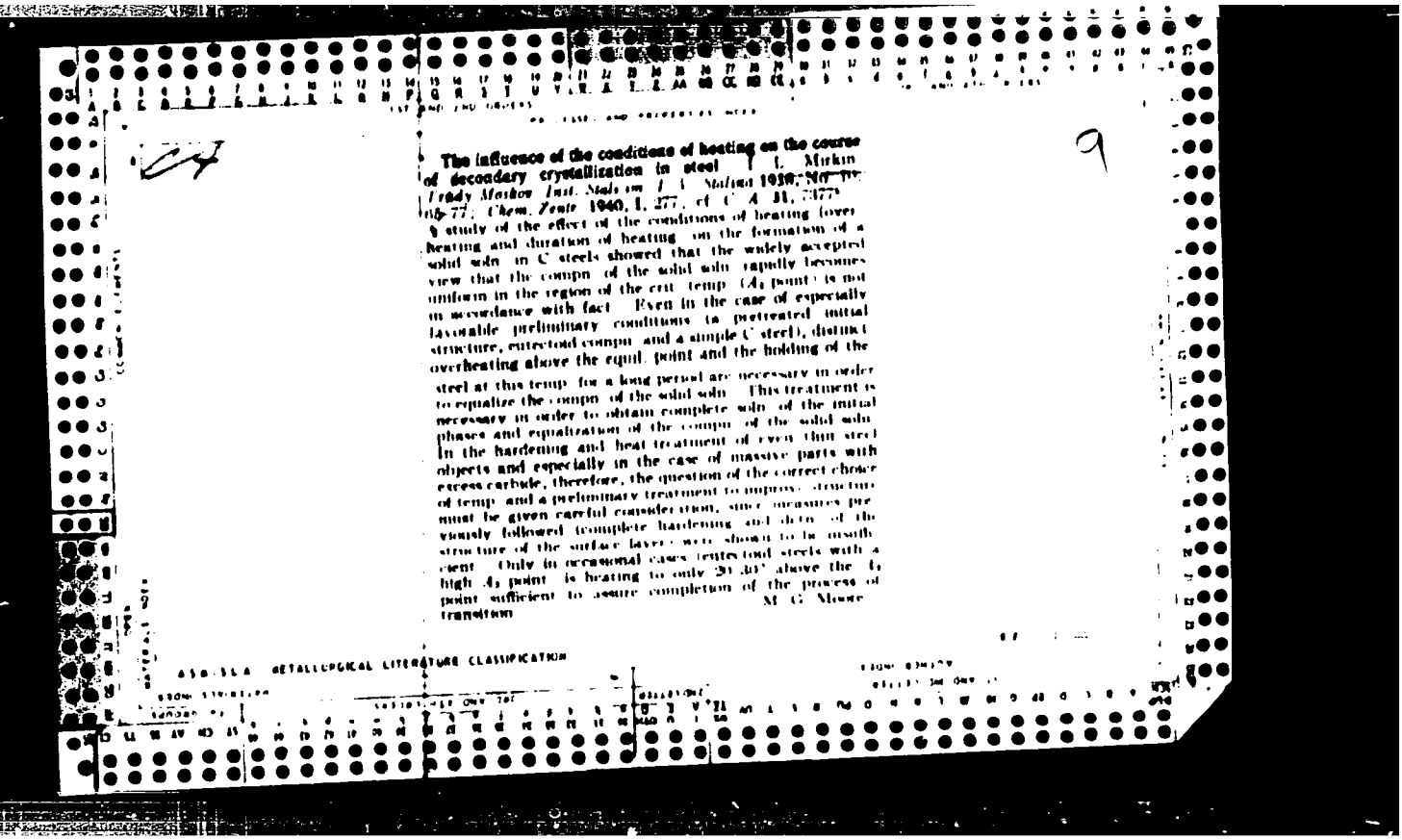


PROCESSES AND PROPERTIES INDEX

9

The formation of centers of crystallization. An attempt to develop a fluctuation theory for the problem of transitions in steel. I. L. Mirkin. Trudy Moskov. Inst. Stali im. I. V. Stalina 1938, No. 10, 38-65; Chem. Zentr. 1940, I, 13. M. G. Moore

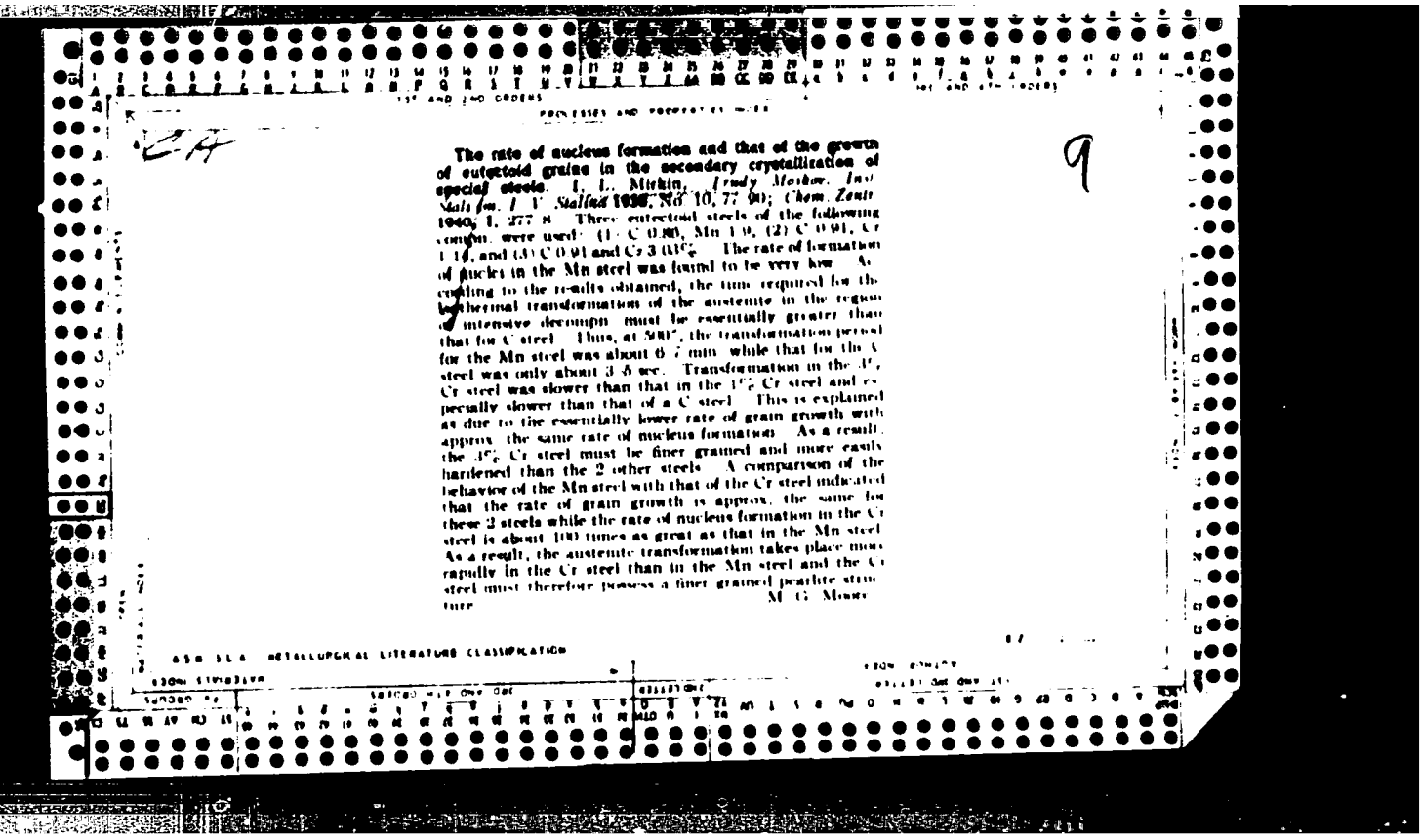
A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION



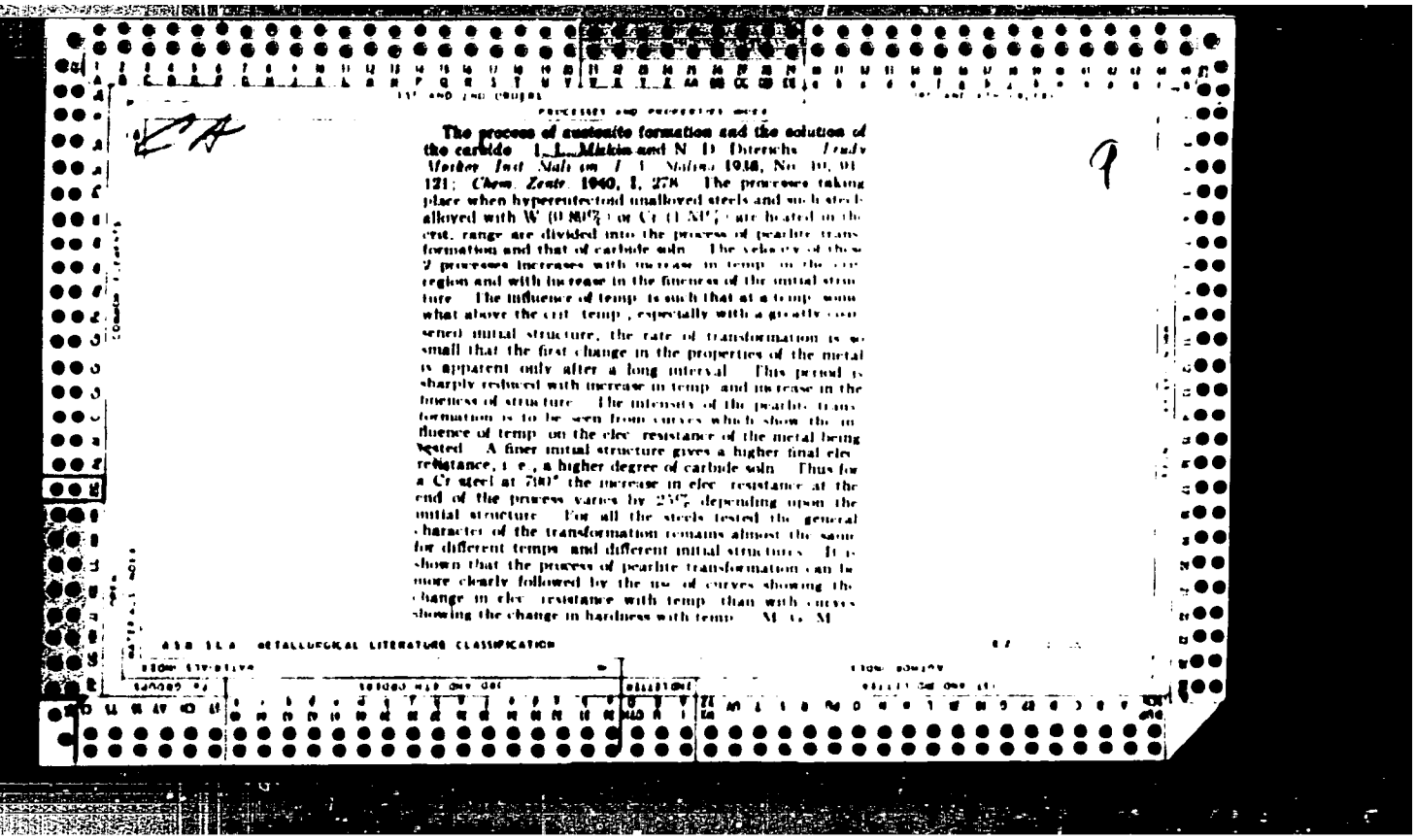
The influence of the conditions of heating on the course of secondary crystallization in steel I. Mirkin. *Trudy Moskov. Inst. Stali im I. V. Stalina* 1938, No. 10, 77; *Chem. Zentr.* 1940, I, 577; cf. *C. A.* 31, 7377[illegible]. A study of the effect of the conditions of heating (over heating and duration of heating) on the formation of a solid soln. in C steels showed that the widely accepted view that the compn. of the solid soln. rapidly becomes uniform in the region of the crit. temp. (A_1 point) is not in accordance with fact. Even in the case of especially favorable preliminary conditions (a pretreated initial structure, eutectoid compn. and a simple C steel), distinct overheating above the equil. point and the holding of the steel at this temp. for a long period are necessary in order to equalize the compn. of the solid soln. This treatment is necessary in order to obtain complete soln. of the initial phases and equalization of the compn. of the solid soln. In the hardening and heat treatment of even thin steel objects and especially in the case of massive parts with excess carbide, therefore, the question of the correct choice of temp. and a preliminary treatment to improve structure must be given careful consideration, since measures previously followed (complete hardening and draw. of the structure of the surface layer) were shown to be unsatisfactory. Only in occasional cases (cutting tool steels with a high A_1 point) is heating to only 20-30° above the A_1 point sufficient to assure completion of the process of transition.

M. G. Mesnyankin

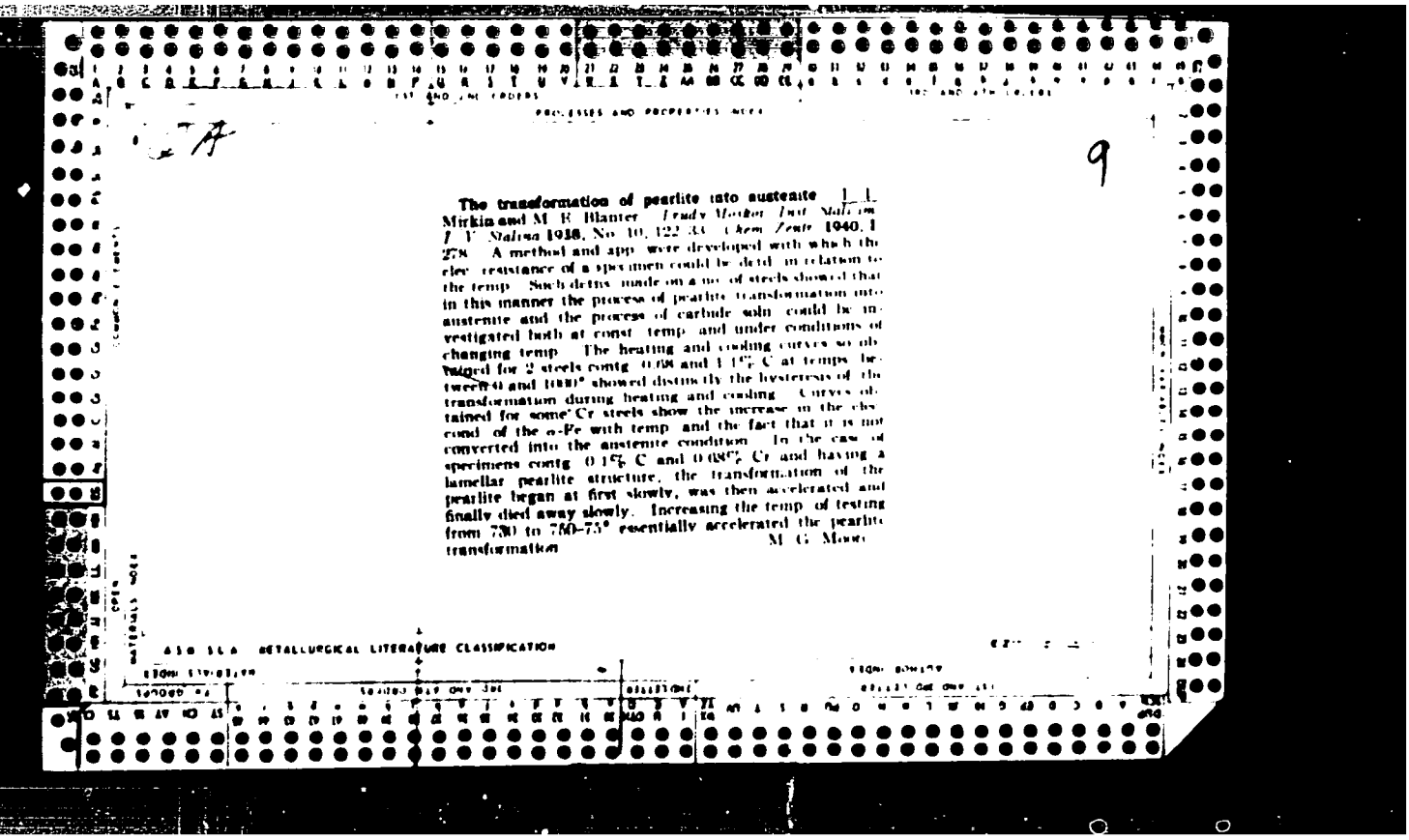
A59-51A METALLURGICAL LITERATURE CLASSIFICATION



The rate of nucleus formation and that of the growth of eutectoid grains in the secondary crystallization of special steels. I. L. Mirkin. *Trudy Moskov. Inst Stali im. I. V. Stalina* 1939, No. 10, 77-90; *Chem. Zentr.* 1940, I, 277-8. Three eutectoid steels of the following compn. were used: (1) C 0.80, Mn 1.0, (2) C 0.91, Cr 1.10, and (3) C 0.91 and Cr 3.03%. The rate of formation of nuclei in the Mn steel was found to be very low. According to the results obtained, the time required for the isothermal transformation of the austenite in the region of intensive decompn. must be essentially greater than that for C steel. Thus, at 500°, the transformation period for the Mn steel was about 6.7 min. while that for the C steel was only about 3.5 sec. Transformation in the 3% Cr steel was slower than that in the 1% Cr steel and especially slower than that of a C steel. This is explained as due to the essentially lower rate of grain growth with approx. the same rate of nucleus formation. As a result, the 3% Cr steel must be finer grained and more easily hardened than the 2 other steels. A comparison of the behavior of the Mn steel with that of the Cr steel indicated that the rate of grain growth is approx. the same for these 2 steels while the rate of nucleus formation in the Cr steel is about 100 times as great as that in the Mn steel. As a result, the austenite transformation takes place more rapidly in the Cr steel than in the Mn steel and the Cr steel must therefore possess a finer grained pearlite structure. M. G. Moses

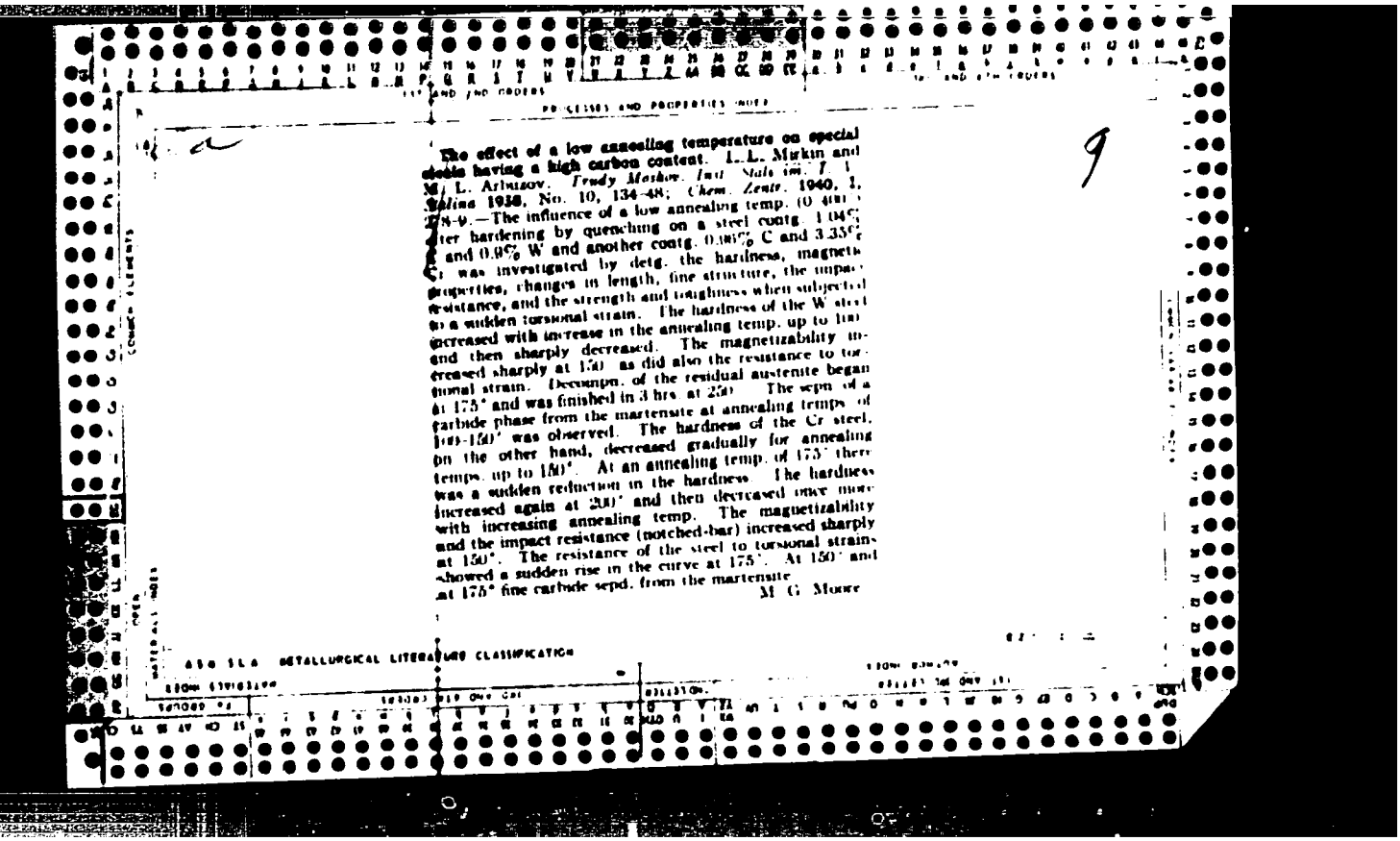


The process of austenite formation and the solution of the carbide I. L. Miklin and N. D. Dieterichs *Trudy Moskov. Inst. Stali im. I. V. Stalina* 1938, No. 10, 91-121; *Chem. Zentr.* 1940, I, 278. The processes taking place when hypereutectoid unalloyed steels and such steels alloyed with W (0.80%) or Cr (1.34%) are heated in the crit. range are divided into the process of pearlite transformation and that of carbide soln. The velocity of these 2 processes increases with increase in temp. in the crit. region and with increase in the fineness of the initial structure. The influence of temp. is such that at a temp. somewhat above the crit. temp., especially with a greatly coarsened initial structure, the rate of transformation is so small that the first change in the properties of the metal is apparent only after a long interval. This period is sharply reduced with increase in temp. and increase in the fineness of structure. The intensity of the pearlite transformation is to be seen from curves which show the influence of temp. on the elec. resistance of the metal being heated. A finer initial structure gives a higher final elec. resistance, i. e., a higher degree of carbide soln. Thus for a Cr steel at 700° the increase in elec. resistance at the end of the process varies by 25% depending upon the initial structure. For all the steels tested the general character of the transformation remains almost the same for different temps. and different initial structures. It is shown that the process of pearlite transformation can be more clearly followed by the use of curves showing the change in elec. resistance with temp. than with curves showing the change in hardness with temp. M. L. M.



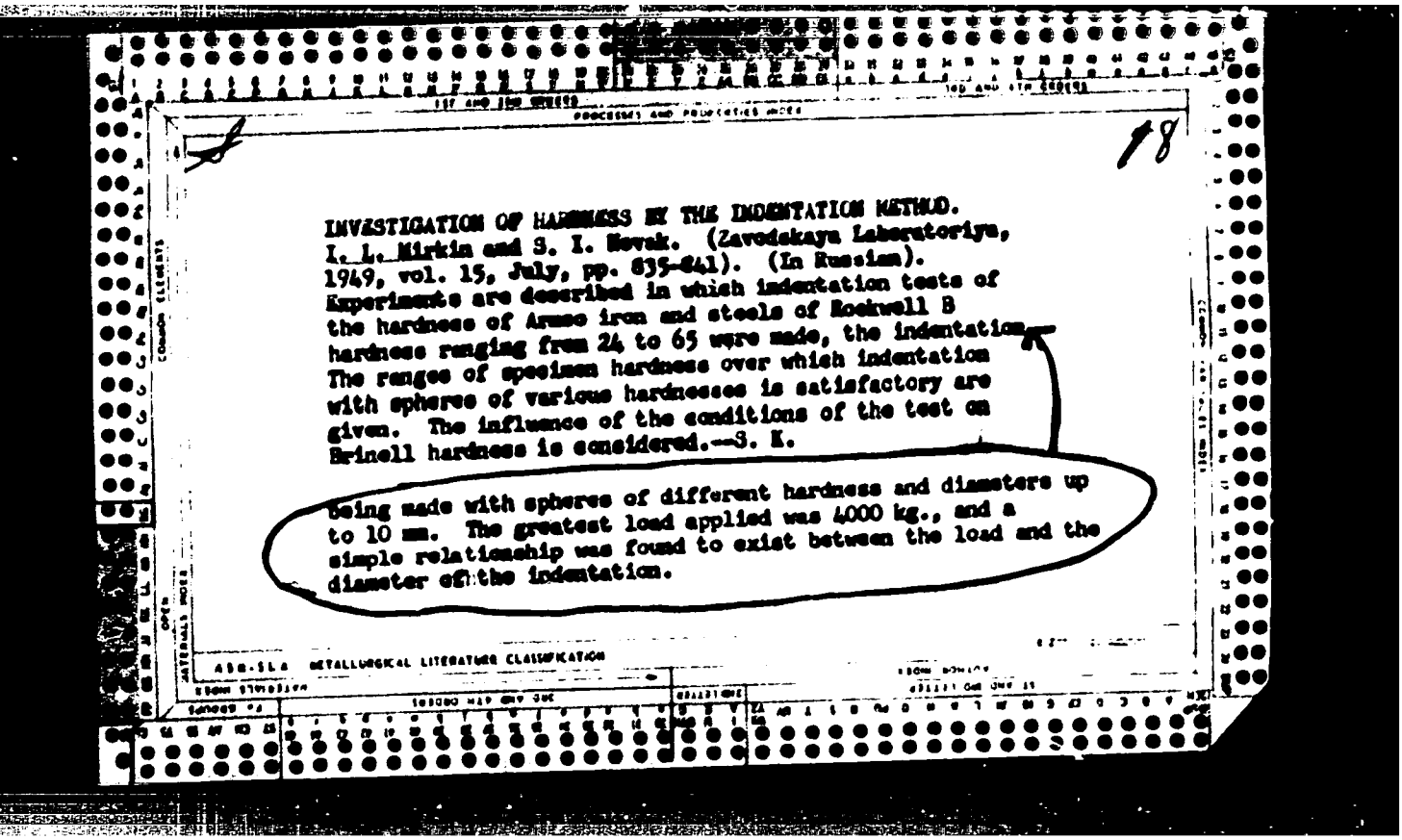
The transformation of pearlite into austenite I. I. Mirkin and M. F. Blanter. *Trudy Moskov. Inst. Stali im I. V. Stalina* **1938**, No. 10, 122-33; *Chem. Zentr.* **1940**, I 278. A method and app. were developed with which the elec. resistance of a specimen could be detd. in relation to the temp. Such detns. made on a no. of steels showed that in this manner the process of pearlite transformation into austenite and the process of carbide soln. could be investigated both at const. temp. and under conditions of changing temp. The heating and cooling curves so obtained for 2 steels contg. 0.98 and 1.14% C at temps. between 740 and 1000° showed distinctly the hysteresis of the transformation during heating and cooling. Curves obtained for some Cr steels show the increase in the elec. cond. of the α-Fe with temp. and the fact that it is not converted into the austenite condition. In the case of specimens contg. 0.1% C and 0.08% Cr and having a lamellar pearlite structure, the transformation of the pearlite began at first slowly, was then accelerated and finally died away slowly. Increasing the temp. of testing from 730 to 760–75° essentially accelerated the pearlite transformation.

M. G. Moore



The effect of a low annealing temperature on special steels having a high carbon content. L. L. Mirkin and M. L. Arkuzov. *Trudy Moskov. Inst. Stali im. I. V. Stalina* **1938**, No. 10, 134-48; *Chem. Zentr.* **1940**, I, 788-9.—The influence of a low annealing temp. (0-400°) after hardening by quenching on a steel contg. 1.04% C and 0.9% W and another contg. 0.86% C and 3.35% Cr and 0.9% W was investigated by detg. the hardness, magnetic properties, changes in length, fine structure, the impact resistance, and the strength and toughness when subjected to a sudden torsional strain. The hardness of the W steel decreased with increase in the annealing temp. up to 100° and then sharply decreased. The magnetizability increased sharply at 150° as did also the resistance to torsional strain. Decompn. of the residual austenite began at 175° and was finished in 3 hrs. at 250°. The segm. of a carbide phase from the martensite at annealing temps. of 100-150° was observed. The hardness of the Cr steel, on the other hand, decreased gradually for annealing temps. up to 150°. At an annealing temp. of 175° there was a sudden reduction in the hardness. The hardness increased again at 200° and then decreased once more with increasing annealing temp. The magnetizability and the impact resistance (notched-bar) increased sharply at 150°. The resistance of the steel to torsional strains showed a sudden rise in the curve at 175°. At 150° and at 175° fine carbide sepd. from the martensite.

M. G. Moore



18

INVESTIGATION OF HARDNESS BY THE INDENTATION METHOD. I. L. Mirkin and S. I. Novak. (Zavodskaya Laboratoriya, 1949, vol. 15, July, pp. 835-841). (In Russian). Experiments are described in which indentation tests of the hardness of Armco iron and steels of Rockwell B hardness ranging from 24 to 65 were made, the indentation being made with spheres of different hardness and diameters up to 10 mm. The greatest load applied was 4000 kg., and a simple relationship was found to exist between the load and the diameter of the indentation. The ranges of specimen hardness over which indentation with spheres of various hardnesses is satisfactory are given. The influence of the conditions of the test on Brinell hardness is considered.—S. K.

USSR/Physics - Hardness Testing
Alloys

Sep 49

"Method for Testing Hardness at High Temperatures," I. L. Mirkin, D. Ye. Livshits, All-Union Inst of Avn Materials, 7 3/4 pp

"Zavod Lab" Vol XV, No 9 - pp. 1080-87

PA 152T90

Describes simple, reliable, and rapid method for testing hardness using metalloceramic indenting element at 600° C in conjunction with a special thermal diffusion process to prevent oxidation. Establishes the correlation between hardness measured at high temperatures and tensile strength for most cases

152T90

USSR/Physics - Hardness Testing (Contd)

Sep 49

examined. Hardness measured at high temperatures found to be more reliable than that at room temperature in showing effect of aging and of alloy components in heat-resistant alloys, as well as behavior of alloys at high temperatures.

152T90

MIRKIN, I. L.

MIRKIN, I. L.

Author: Mirkin, I. L.

Title: The thermal processing of steel with the cold method. (Termicheskaia obrabotka stali kholodom.) 21 p.

City: Moscow

Publication: ---

Date: 1950

Available: Library of Congress

Source: Monthly List of Russian Accessions, Vol. 3, No. 8, Page 534

MIRKIN, I. L

IA 159T61

USSR/Metals - Freezing, Effects
Martensite

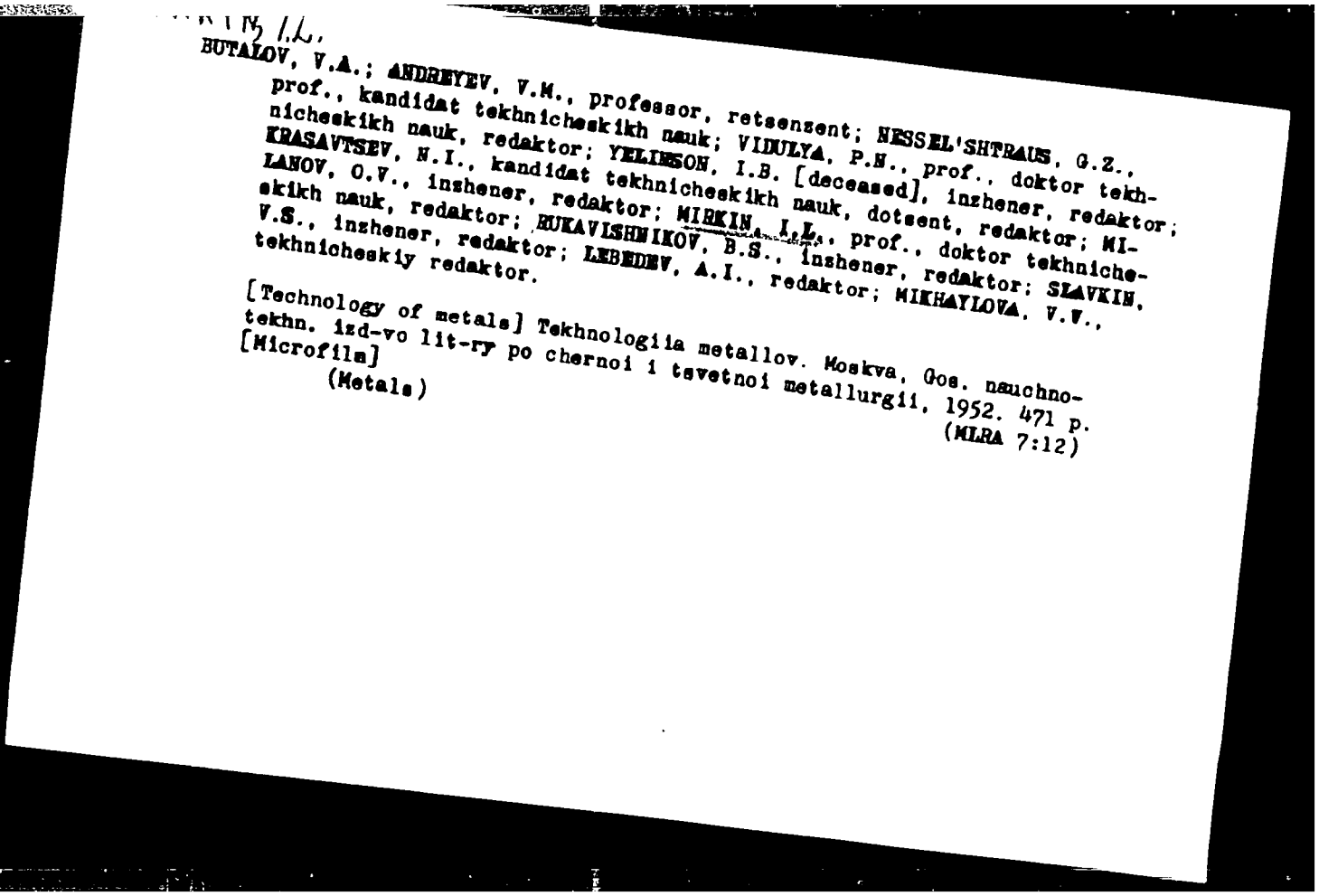
Feb 50

"Application of the Dilatometric Method to Investigating the Martensitic Transformation at Temperatures Below Freezing," I. L. Mirkin, V. S. Yegorov, 8 pp

"Zavod Lab" Vol XVI, No 2

Describes results of employing dilatometric analysis in studying martensitic transformations at temperatures above and below freezing. Used differential dilatometer with photorecorder for experiments. Designed special thermostat-cooler for cooling specimens below freezing point.

159T61



KRIM I.L.

BUTALOV, V.A.; ANDREYEV, V.M., professor, retsenzent; NESSEL'SHTRAUS, G.Z., prof., kandidat tekhnicheskikh nauk; VIDULYA, P.N., prof., doktor tekhnicheskikh nauk, redaktor; YELIESON, I.B. [deceased], inzhener, redaktor; KRASAVTSEV, N.I., kandidat tekhnicheskikh nauk, dotsent, redaktor; MILANOV, O.V., inzhener, redaktor; MIRKIN, I.L., prof., doktor tekhnicheskikh nauk, redaktor; KUKAVISHNIKOV, B.S., inzhener, redaktor; SLAVKIN, V.S., inzhener, redaktor; LEBEDEV, A.I., redaktor; MIKHAYLOVA, V.V., tekhnicheskiy redaktor.

[Technology of metals] Tekhnologiia metallov. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1952. 471 p. [Microfilm]
(Metals)
(MLRA 7:12)

CHERVYAKOV, A.N.; MIRKIN, I.L., doktor tekhnicheskikh nauk, professor, redaktor; SHAROPIN, V.D., redaktor; ATTOPOVICH, M.K., tekhnicheskiy redaktor.

[Metallographic identification of impurities in steel] Metallograficheskoe opredelenie vkliuchenii v stali. Pod red. I.L.Mirkina. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1953. 116 p.
(Steel--Metallography) (MLRA 7:8)

MIRKIN, I.L.

SALLI, A.; MIRKIN, I.L., professor [translator]; GIL'BERG, L.A., redaktor; GLADKIKH, N.N., tekhnicheskiy redaktor.

[Metallic creep and heatresistant alloys] Polzuchest' metallov i zharoprochnye splavy. Perevod s angliiskogo i nauchnaia red. I.L.Mirkina. Moskva, Gos. izd-vo oboronnoi promyshlennosti, 1953. 290 p. (MLRA 7:8)
(Creep of metals) (Alloys)

MIRKIN, I. L.

USSR.

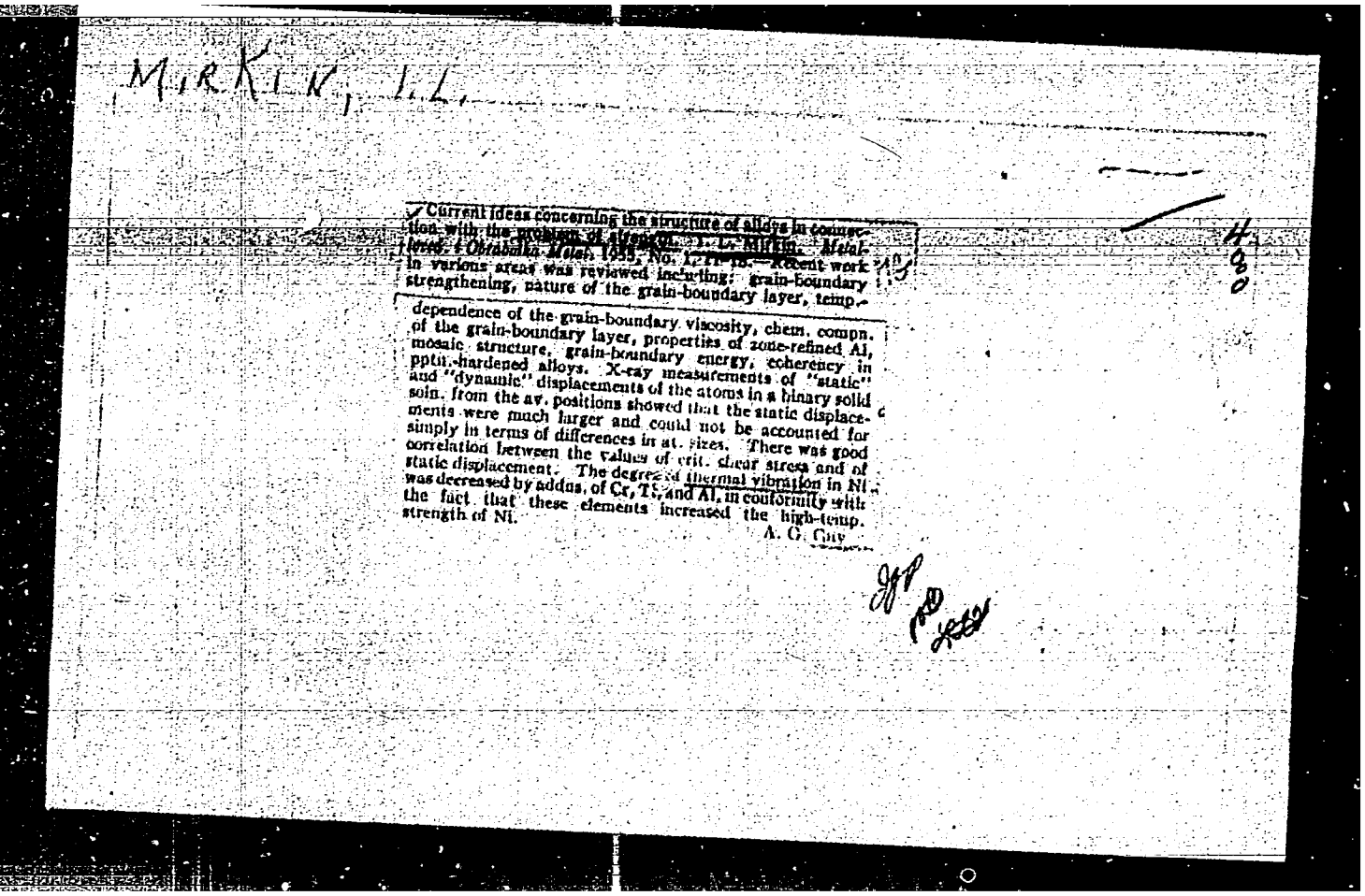
283/114 669.14.291

On the Separate Effect of Structural Factors on Cyclic Strength of Steel

Zh.tekh.Fiz. 24(12),2209-2216 1954 U.S.S.R.

I.L. Mirkin and E.D. Tsypkina

Cyclic strength of low carbon constructional steel alloyed with C, Mn, Si, Cr, Ni and W, assessed by its strength at pulsating load (symmetrical bending), depends on its chemical composition and structure. The behaviour of static and cyclic strength is nearly proportional. Alloying of low carbon steel in an annealed state enhances both static and cyclic strength. The size of ferrite grains does not affect any changes in strength at pulsating load. Overheating of steel, providing it does not reduce resistance to ductile fracturing, does not influence the strength at pulsating load, either. Cold hardening has the same effect as the resistance to fracture.(Bibl.15)



MIRKIN, I. L.

Current ideas concerning the structure of alloys in connection with the problem of strength. I. L. Mirkin. *Metalloved. i Obrabotka Metallov* 1955, No. 1, 11–18.—Recent work in various areas was reviewed including: grain-boundary strengthening, nature of the grain-boundary layer, temp.-dependence of the grain-boundary viscosity, chem. compn. of the grain-boundary layer, properties of zone-refined Al, mosaic structure, grain-boundary energy, coherency in pptn.-hardened alloys. X-ray measurements of "static" and "dynamic" displacements of the atoms in a binary solid soln. from the av. positions showed that the static displacements were much larger and could not be accounted for simply in terms of differences in at. sizes. There was good correlation between the values of crit. shear stress and of static displacement. The degree of thermal vibration in Ni was decreased by addns. of Cr, Ti, and Al, in conformity with the fact that these elements increased the high-temp. strength of Ni.

A. G. Guy

MIRKIN, I. L.

USSR/ Engineering - Testing methods

Card 1/1 : Pub. 128 - 16/25

Authors : Mirkin, I. L., and Tsypkina, E. D.

Title : About the selection of a steel structure for components operating under cyclic loads

Periodical : Vest. mash. 1, 72-75, Jan 1955

Abstract : A narrative report is presented concerning investigations conducted by the Central Scientific Research Institute of the Ministry for Ship Building Industry, on methods for selecting proper types of steel for components operating under cyclic loads. Technical data is presented on steel specifications, types of specimen used, and the graphic calculation of cyclic loads. Two USSR references (1947). Tables; graphs; drawing.

Institution : .....

Submitted : .....

MIRKIN, I. L.

1539* Study of Distribution of Properties in Surface Layer During Machining of Steel. Issledovanie raspredeleniia svoistv v poverkhnostnom sloe pri mekhanicheskom obrabotke stali. (Russian.) I. L. Mirkin and T. A. Sirenko. *Metallovedenie i obrabotka* [illegible], 1956, no. 2, Aug., p. 50-56.

Relation between microhardness and original tensile stress in zone of uniform plastic deformation, and between amount of metal removed and surface properties. Tables, diagram, graphs, micrograph. 9 ref.

SOV/137-57-11 22337

Translation from Referativnyy zhurnal, Metallurgiya 1957 No 11 p 242 (USSR)

AUTHORS Mirkin I.L., Trunin I.I.

TITLE An Investigation Into Creep and the Destruction of Steel in the Zone of Stress Concentration (Issledovaniye polzuchesti i razrusheniya stali v zone kontsentratsii napryazheniy)

PERIODICAL V sb. Prochnost' metallov. Moscow, AN SSSR, 1956, pp 117-132

ABSTRACT An analysis is provided of the stressed and deformed states of metal and of the process of failure in the creep testing of cylindrical specimens (S) of various degrees of rigidity with annular notches (N). Steels EI-10 and EI-257 are the objects of investigation. Two identical annular N, 40 mm apart, are made on each S to eliminate the mutual influence of unevenly stressed states arising in cross sections of these N. Rigidity is estimated by the stress concentration at the apex of the N and the degree to which the stressed state becomes three-dimensional to a point at which this is a real factor. An approximate estimate of the value of the plastic deformation (D) in each portion of the cross section is made in terms of the

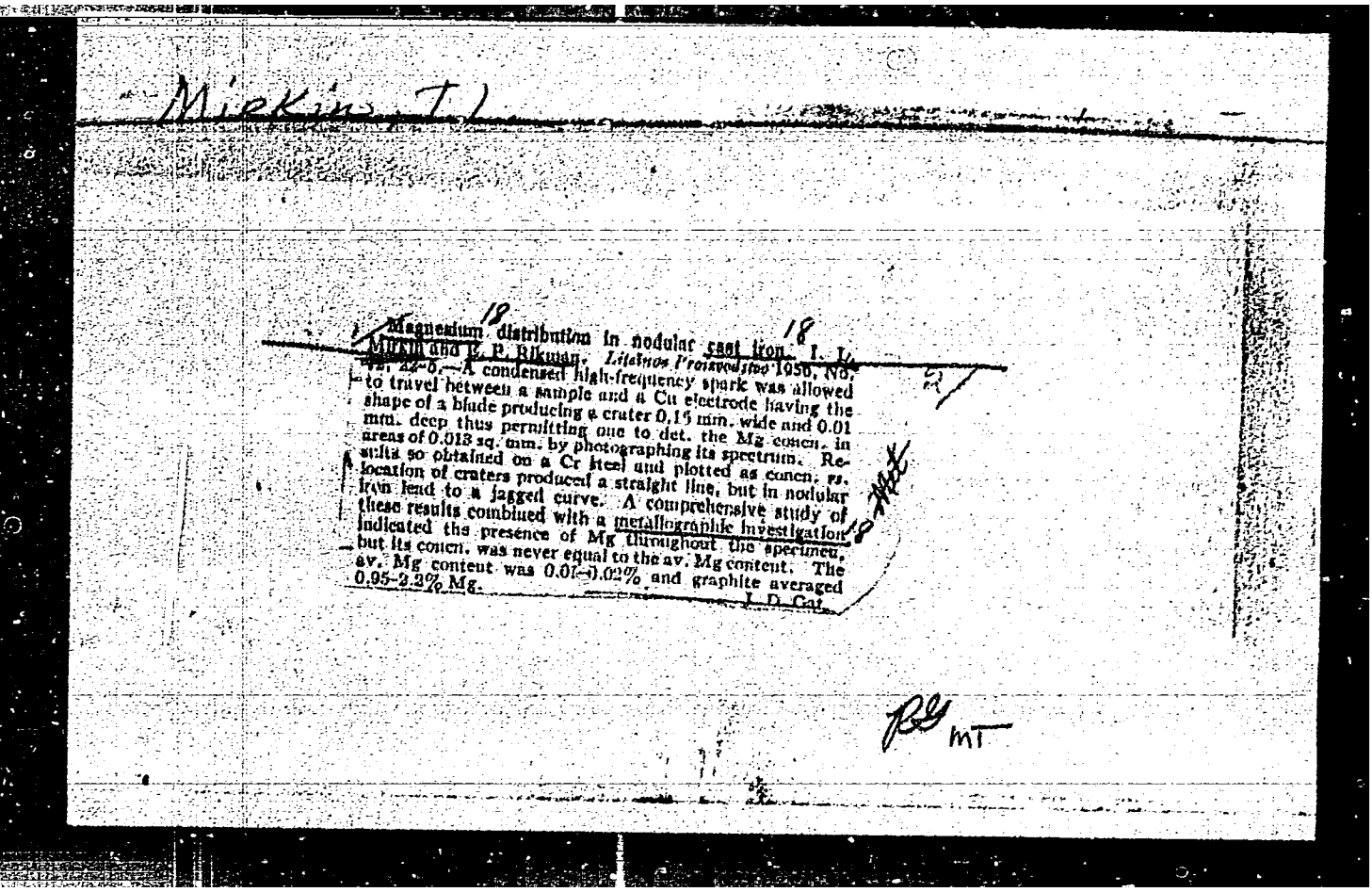
Card 1/2

An Investigation Into Creep and the Destruction of Steel (cont.)

increase in microhardness relative to its value at the center of the smallest cross section of the S. It is found that at various degrees of stress concentration, various durations and temperatures of testing, a pronounced unevenness in distribution of stresses and of plastic D in the metal beneath the N remains, as does the three-dimensional nature of the stressed state observed during standard tensile testing of notch S at room temperature. Maximum plastic deformation occurs in the layers of metal close to the surface at the bottom of the N. D drops rapidly with distance from the N and radially toward the deeper layers of metal in the direction of the center of the smallest cross section of the S, and a boundary is found between the region of large plastic and small elastic-plastic D. In this zone, at a depth of 0.2-0.4 mm from the bottom of the N, primary loci of failure are found and normal axial stresses attain a peak. Failure always arises and begins to spread from the grain boundaries, and is of the nature of cleavage of crystal particles away from each other along their boundaries.

L.G.

Card 2/2



Mirkin, I. L.

18 18

Magnesium distribution in nodular cast iron. I. L. Mirkin and L. P. Rikman. *Liteinoe Proizvodstvo* 1950, No. 12, 22–5.—A condensed high-frequency spark was allowed to travel between a sample and a Cu electrode having the shape of a blade producing a crater 0.15 mm. wide and 0.01 mm. deep thus permitting one to det. the Mg concn. in areas of 0.013 sq. mm. by photographing its spectrum. Results so obtained on a Cr steel and plotted as concn. vs. location of craters produced a straight line, but in nodular iron lead to a jagged curve. A comprehensive study of these results combined with a metallographic investigation indicated the presence of Mg throughout the specimen, but its concn. was never equal to the av. Mg content. The av. Mg content was 0.01–0.02% and graphite averaged 0.95–2.3% Mg.

J. D. Cat

RB MT

MIRKIN, I.L., professor, doktor; TRUNIN, I.I., inzhener.

"Methods for hot mechanical testing of metals". A.M.Borzdyka. Reviewed by I.L.Mirkin, I.I.Trunin. Zav.lab.22 no.2:253-255 F '56. (MLRA 9:6)
(Metals--Testing) (Borzdyka, Anatolii Matveevich)

MIRKIN, I.L.; RIKMAN, E.P.

Determining magnesium in cast iron by the method of local analysis
Zav.lab. 22 no.8:930-936 Ag '56. (MLRA 9:11)

1. Tul'skiy mekhanicheskiy institut.
(Cast iron--Analysis) (Magnesium--Analysis)

SOV/137-57-11-22151

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 211 (USSR)

AUTHOR: Mirkin, I.L.

TITLE: On the Mechanism of Diffusion in Solid Metals (O mekhanizme diffuzii v tverdykh metallakh)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov. Moscow, Mashgiz, 1957, pp 5-24

ABSTRACT: A review of diffusion in solid metals on the basis of the analysis of existing theoretical calculations and experimental data. Bibliography: 34 references.

A.Z.

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MIRKIN, I. L.

124-11-13571

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr 11, p 175 (USSR)

AUTHORS: Mirkin, I. L., and Trunin, I. I.

TITLE: Investigation of the Creep and Failure of Steel in the Stress-Concentration Zone (Issledovaniye polzychesti i razrusheniya stali v zone kontsentratsii napryazheniy)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov, Moscow, Mashgiz, 1957, pp 25-45

ABSTRACT: The paper describes tests on the creep and continued strength of cylindrical samples with circular notches made of heat-treated steel EI257 or EI10 throughout a temperature range of 550° to 650° C. Having determined the increment of micro-hardness at various points of a longitudinal grind, the Authors have found, with approximation, the zone of maximal plastic deformation. The failure process was analyzed with the aid of microscopic structural analysis of strata-wise grinds. A number of properties established at room temperature remained unchanged under test conditions, namely: a pronounced non-uniformity of the stress distribution and plastic deformation of the

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Investigation of the Creep and Failure of Steel in the Stress-Concentration Zone (Continued)

metal underneath the notch; a deformation peak within the near-surface layers of the metal directly below the furrow of the notch. The deformation rate drops steeply from the surface layer to the center of the sample. Inception of failure occurs at a depth of 0.2 to 0.4 mm. from the bottom of the notch. The peak of axial stresses lies near the bottom of the notch and close to the location of incipient failure. It is deduced therefrom that the normal stress is the determining stress during failure. Through relaxation the peak stresses diminish somewhat with the passing of time. Failure always occurred along the grain perimeter.

Bibliography: 8 references.

(V. S. Namestnikov)

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129-2-2/10

AUTHOR: Mirkin, I.L., Dr. of Technical Sciences Prof., Solonouts, M.I., Eng.

TITLE: Change in the Structure and Properties of 15M and 20M Tubing Steels During Operation. (Izmeneniye struktury i svoystv trubnykh staley 15M i 20M pri ekspluatatsii)

PERIODICAL: Metallovedeniye i obrabotka metallov, 1957, No. 2, pp. 11-18, (U.S.S.R.)

ABSTRACT: The basic results obtained by Robinson (1) and Norton (2) are briefly mentioned. The authors of this paper analyse the results of investigations on 15M and 20M steel tubing for different working periods and also the data on the changes in these steels during operation. The data were obtained in ЦНИИТМАШ Laboratories (3) and at the ВТИ im Dzerzhrnskogo (4). The composition and the working conditions for the materials tested are given in Table 1, p. 12. Certain parts of high pressure piping were selected for testing and surfaces were welded on to these, for the purpose of directly measuring creep. The analysis was based on comparing cut-offs in the original state and after operation between 490 to

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TITLE: Change in the Structure and Properties of 15M and 20M Tubing Steels During Operation. (Izmeneniye struktury i svoystv trubnykh staley 15M i 20M pri ekspluatatsii)

129-2-2/10

510°C for durations of 1200 to 50,000 hours. The results of Solonouts, M.I. (3), Kontorovskiy (4) and Sinnert (5) were used. Sinnert gives the properties relating to steel 15M (presumably an American equivelent of that steel) after 100,000 hours of operation at 480°C and also the results of direct measurements of creep. The micro-structure of the steel is described, and micro-photographs of two materials in the original state and after 25,000 and 35,000 hours respectively are included. The changes in the mechanical properties are discussed and evaluated dealing particularly with resistance to creep and prolong duration strength. Material in the original state and equivalent material which has been in operation in boilers for 12,000 to 100,000 hours were tested and creep tests for durations of 2,000 to 2,500 hours were made. In ultimate strength tests the failure time varied from a few dozen hours to 2,000 - 3,000 hours. Fig. 3 shows primary creep curves

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TITLE: Change in the Structure and Properties of 15M and 20M Tubing Steels During Operation. (Izmeneniye struktury i svoystv trubnykh staley 15M i 20M pri ekspluatatsii)

for material in the original state and after 35,000 hours of operation. Fig. 4 shows the depencence of the time until failure on the applied stress for several materials. Fig. 5 shows the parametric dependence introduced by Larsen and Miller (8) for one melt. Table 3 gives data on the chemical composition of the carbide phase for eleven of the materials under consideration. The study presented here confirmed the decrease of the strength of metal caused by structural changes and molydbenum impoverishment of the solid solution. The reduced mechanical properties are most pronounced as regards the change of the ultimate strength and are directly related to the structure of the steel in the original state. Reduction of the strength of the material takes place mainly during the first period of operation and an increase in the service time above 15,000 hours does not cause an appreciable decrease in strength which is fully in accordance with the changes of the structure and of the phase state of the steel. The data obtained indicate that steels 15M and 20M are not sufficiently stable under

TITLE: Change in the Structure and Properties of 15M and 20M Tubing Steels During Operation. (Izmeneniye struktury i svoystv trubnykh staley 15M i 20M pri ekspluatatsii) 129-2-2/19

extended operation at temperatures of 500°C and higher and that their heat resistance decreases appreciably under these conditions. According to Sinnert (5) steel containing 0.6% Mo is capable of maintaining a very high degree of heat resistance after 100,000 hours of operation at 480°C under a stress of about 5 kg/mm².

The text includes 3 tables, 2 sets of photographs and 3 sets of graphs. There are 8 references of which 3 are Slavic.

ASSOCIATION: ЦНИИТМАШ

PRESENTED BY: ---

SUBMITTED: —

AVAILABLE: Library of Congress.

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Mirkin I. L.

E-9

USSR/Solid State Physics - Mechanical Properties of Crystals and Poly-Crystalline Compounds

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1111

Author : Mirkin, I.L., Trunin, I.I.

Inst : General Scientific Research Institute for Technology and Machine Building

Title : Investigation of the Failure Zone in Creep

Orig Pub : Metallovedeniye i obrabotka metallov, 1957, No 6, 2-7

Abstract : It was established experimentally that there is a reduction in the microhardness of the metal near the cracks that occur during creep. This is explained by the crumbling of the material, due to accumulation of vacant sites of the crystalline lattice in places that are located near the visible damage centers. In an investigation of the EI10 steel, the reduction in the hardness, due to

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USSR/Solid State Physics - Mechanical Properties of Crystals and Poly-Crystalline Compounds

E-9

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1111

crumbling, is observed in a band approximately 100 micron wide. The greatest reduction in the microhardness (the maximum crumbling) reaches 12 -- 14%.

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MIRKIN, I.L.; RIKMAN, E.P.

Distribution of magnesium in high-strength cast iron. Lit.proizv. no.12:13-16 D '57. (MIRA 11:1)
(Iron-magnesium alloys--Metallography)

MIRKIN, L.L.; TRUNIN, I.I.

Statistical method for investigating the destruction zone of metals by measuring microhardness. Zav.lab. 23 no.2:229-235 '57. (MLRA 10:3)

1.TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.
(Metals--Testing)

AUTHORS: Mirkin, I.L., Rikman, E.P.

TITLE: On a Method of Microspectral Analysis (Ob odnom metode mikrospektral'nogo analiza) 32-11-28/60

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 11, pp.1338-1341 (USSR)

ABSTRACT: The methods of local analysis by volume hitherto published are described as being either too complicated (1) or having a limited localization (2,3), or being restricted by certain conditions (4). In contrast to the said publications a new method of local analysis is suggested here by means of which the "punctuating" rectified highfrequency current is used. The necessary highfrequency current was in this case taken from the generator "ПС -39" and was rectified by the kenotron "2Ц, 2С". The sample was introduced as a cathode of the arc, while a steel needle served as anode which, according to the task to be performed, was adjusted either parallel or vertical to the slit of the spectrograph. The spark was focused "almost sharply" on the slit of the spectrograph "ПС-22" by the lens "ПС -197" with an enlargement 2. Films of the type "Spektral'nyye I" were used. A further improvement of this method consisted in the selection of the part of the sample to be subjected to local analysis being rendered more simple. The metallographical micro-

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scope was used for this purpose, a device which is described as follows: An apparatus for the micro-measurement of hardness "MPT-3" was used in the spectrograph instead of a universal stand for the electrode. Instead of the diamond fitting a steel needle with a suitable thread is mounted, which then serves as an anode. The sample is here clamped on by a special device and is insulated against the stand by plastellite bases. The clamp on the sample and the fitting of the needle are connected with the kenotron rectifier by means of wires. The device is mounted onto the rail of the spectrograph, so that it may be shifted along this rail. A microscope is provided by means of which it is possible to select the necessary micro-place (enlargement 1:100). It is also possible to measure analytical spacings with an accuracy of up to 0.00 2 mm, as also the (spark) craters and the switching values. There follows an instruction as to how this device should be used. There are 4 figures, 1 table, and 9 references, 8 of which are Slavic.

ASSOCIATION: Tula Mechanical Institute (Tul'skiy mekhanicheskiy institut)

AVAILABLE: Library of Congress

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MIRKIN, I.L., professor, doktor tekhnicheskikh nauk.

Diffusion mechanics in hard metals. [Trudy] TSNIITMASH no.79:5-24 '57. (MIRA 10:6)

(Diffusion)

MIRKIN, I.L., professor, doktor tekhnicheskikh nauk; TRUNIN, I.I., inzhener.

Investigating creep and failure in the stress concentration zone in steel. [Trudy] TSNIITMASH no.79:25-45 '57. (MLRA 10:6)
(Steel--Metallography) (Steel--Testing) (Creep of metals)

MIRKIN, I.L.

Atomic mechanism of aging in multicomponent alloys. Issl. po zharopr. splav. 3:34-49 '58. (MIRA 11:11)
(Alloys--Metallography) (Metal crystals)

AUTHOR: Gulyayev, B.B. SOV/24-58-4-37/39

TITLE: Conference on Crystallisation of Metals (Soveshchaniye po kristallizatsii metallov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 4, pp 153 - 155 (USSR)

ABSTRACT: This conference was held at the Institut mashinovedeniya AN SSSR (Institute of Mechanical Engineering of the Ac.Sc. USSR) on June 25-31, 1958. About 400 people participated and the participants included specialists in the fields of foundry, metallurgy, crystallography, physics, welding, heat, physical chemistry, mathematical physics and other related subjects. In addition to Soviet participants, foreign visitors included Professor D. Czikl (East Germany) and N.I. Chvorinov (Czechoslovakia). This conference on crystallisation of metals was the fourth conference relating to the general problem of the theory of foundry processes.

Conference on Crystallisation of Metals SOV/24-58-4-37/39

General Problems of Crystallisation of Metals

Member of the Ac.Sc. Belorussian SSR N.N. Sirota, in his paper "On the Mechanism of the Process of Crystallisation", proposed a general physico-mathematical theory on germination and the growth of crystals and described its application to problems of crystallisation of metals.

Corresponding Member of the Ac.Sc. Ukrainian SSR K.P. Bunin and Yu.N. Taran, in their paper "Eutectic Crystallisation of Grey Irons", considered the features of formation of graphite separations in eutectic alloys from the point of view of the general theory of crystallisation of iron. B.Ya. Lyubov, in his paper "Calculation of the Speed of Solidification of Metals in Large Volumes", proposed a synthesis of the molecular-kinetic and of the thermal theories of crystallisation of metallic castings. A.G. Spasskiy, in the paper "Fundamental Factors Influencing the Structure of Castings" and M.V. Mal'tsev in the paper "Methods of Improving the Quality of Cast Metal", described results of their investigations of crystallisation of castings from various alloys and considered methods of controlling such processes.

I.L. Mirkin dealt with the influence of fluctuations in the concentration on the formation of crystallisation nuclei and formation of crystals in complex alloys. G.P. Ivantsov gave a review of the present concepts on germination and the growth of crystals. O.N. Magnitskiy, A.A. Demidova and B.B. Gulyayev considered the influence of the speed of crystallisation and the composition of the alloys on the quantitative characteristics of the structure and the mechanical properties of castings of the systems iron-carbon and aluminium-silicon. D.S. Kamenetskaya, N.P. Bakhmanova and Ye.Z. Spektor dealt with the results of investigation of the kinetics of crystallisation of iron and its alloys. G.P. Balandin proposed a mathematical theory of formation of the structure of castings and applied it for elucidating the features of crystallisation of iron. Ya.V. Grechnyy dealt with the features of crystallisation of binary alloys of various types.

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SOV/129-58-9-7/16

AUTHORS: Mirkin, I. L., Doctor of Technical Science Professor and Sirenko, T. A., Engineer

TITLE: Investigation of the Properties of the Surface Layer in the Case of Chipless Shaping of Steel with Various Quantities of the Carbide Phase (Issledovaniye svoystv poverkhnostnogo sloya pri besstruzhkovoy obrabotke stali s razlichnym kolichestvom karbidnoy fazy)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 9, pp 29-33 (USSR)

ABSTRACT: An attempt has been made to determine the real mechanical properties of the thin surface layer of the metal which is subjected to shaping by piercing (tube manufacture) and to establish a relation between the properties of the metal and the quantity of the carbide phase. The compositions of the investigated steels (Steels 30, 50, U) are entered in Table 1. The quantity of the cementite in the Steel 30, containing 0.32% C, was about 4.8 wt.%, and in the Steel U8 about 12%. For eliminating the influence of the degree of dispersion of the carbide particles on the hardening of the steel during the piercing operation, the material was hardened and then

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tempered so as to ensure an approximately equal grain size of the cementite in all the three investigated materials. Data on the initial mechanical properties of the steels used in the experiment are entered in Table 2. In Fig.1 the size distribution is graphed of the carbide particles for the investigated steels, the carbon contents of which were 0.32, 0.40 and 0.78%. In Fig.2 the hardening of the surface layer of the investigated steels during the piercing operation is graphed (micro-hardness vs. distance from the piercing surface). In Fig.3 the dependence is graphed of the degree of hardening of the surface layer during piercing on the carbon content. The change of the depth of the deformed layer during piercing as a function of the carbon content is graphed in Fig.4. Fig.5 shows the distribution of the real stresses in the surface layer in the case of piercing. In Fig.6 the "histograms" are shown of the distribution of the micro-non-uniformities on the pierced surface of the steel for various carbon

Investigation of the Properties of the Surface Layer in the Case of Chipless Shaping of Steel with Various Quantities of the Carbide Phase

contents. The following conclusions are arrived at:
1. The characteristics of the surface layer of structural steel shaped by piercing differs appreciably from that of the metal in the initial state. The real strength in the thin surface layer is twice as high as its initial value pertaining to the deeper layers of the Steels 30 and 50. This permits higher loading or reducing the walls of tubular components for certain loads.
2. The scheme of distribution of the real stresses τ_{max}, which act during the shaping in the thin surface layer depends on the quantity of cementite in the steel. Increase of the quantity of cementite grains with average dimensions near to each other (0.5 microns) leads to a considerable increase of τ_{max} at the piercing surface. The degree of hardening and the depth of the deformed layer decrease sharply with increasing quantities of hard and brittle carbide particles. The

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dependences between the degree of hardening, the [illegible]
of the deformed layer and the quantity of carbon under
the pertaining conditions of investigation are almost
linear.

3. Of the investigated steels the most suitable for shaping by piercing is the Steel 50, the real strength of which on the work hardened surface is almost twice that of the deeper layers and reaches the value of τ_{max} = 62 kg/mm^2. The depth of the deformed layer for this steel is about 400 microns. Since the surface quality is very high and the work hardening is considerable, use of this steel ensures obtaining high quality mass produced components.

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S/V/129-58-9-7/16

Investigation of the Properties of the Surface Layer in the Case of Chipless Shaping of Steel with Various Quantities of the Ferrite Phase

There are 6 figures, 2 tables and 5 references, all of which are Soviet.

ASSOCIATION: Tul'skiy mekhanicheskiy institut (Tula Mechanical Institute)

1. Steel--Deformation 2. Steel--Surface properties 3. Steel --Phase studies 4. Steel--Test results 5. Steel tubing--Production

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SOV/129-58-11-4/13

AUTHORS: Trunin, I. I., Engineer, and Mirkin, I.L, Doctor of Technical Sciences, Professor.

TITLE: Investigation of the Creep Failure of Steel (Issledovaniye razrusheniya stali pri polzuchesti)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 11, pp 25-32 (USSR)

ABSTRACT: The authors studied the failure in the stress concentration zone for three-dimensional tensile forces under creep conditions. In earlier work (Ref 1) the method of static micro-hardness measurements on cuts prepared from the failure zone of notched specimens after long duration strength tests was applied, a method described in another paper of the authors (Ref 2). On the basis of investigating the pearlitic steel EI10 it was shown that the formation of micro and macro-cracks is preceded by a loosening of the metal which is evidenced by a reduced resistance to squeezing inside a radius of 100μ around the visible failure spot. For verifying earlier obtained results, the authors investigated smooth specimens of the steel EI10 and notched specimens of the steels EI257 and 1Kh18N12T. For ferromagnetic materials, the magneto-

Card 1/3 metallographic analysis was also used. The measured

micro-hardness values in the zone of influence of the entire notch are entered in Table 1. For elucidating the nature of settling of magnetic particles around visible failure spots, a cut with a visible crack and only small failure foci was magnetised; the magnetic particles settled intensively along the crack and filled up the entire surface of the failure area, see Fig.1. The magneto-metallographic investigations also enabled establishing the existence of a loosening of the material which precedes the formation of visible failure spots. If the defects in the loosened zone are such that heating can heal them, an appropriate heat treatment should bring about an increase of the relative resistance to squeezing and local disturbances of the magnetic field should cease. To verify this assumption experiments were carried out, the results of which are entered in Table 2; heating to 650°C brings about an increase in the micro-hardness of the metal near to the edge of the crack, whilst the resistance to pressing in of the "healthy" metal remains almost unchanged. On the basis of the results obtained by the authors of this paper and comparison of these with